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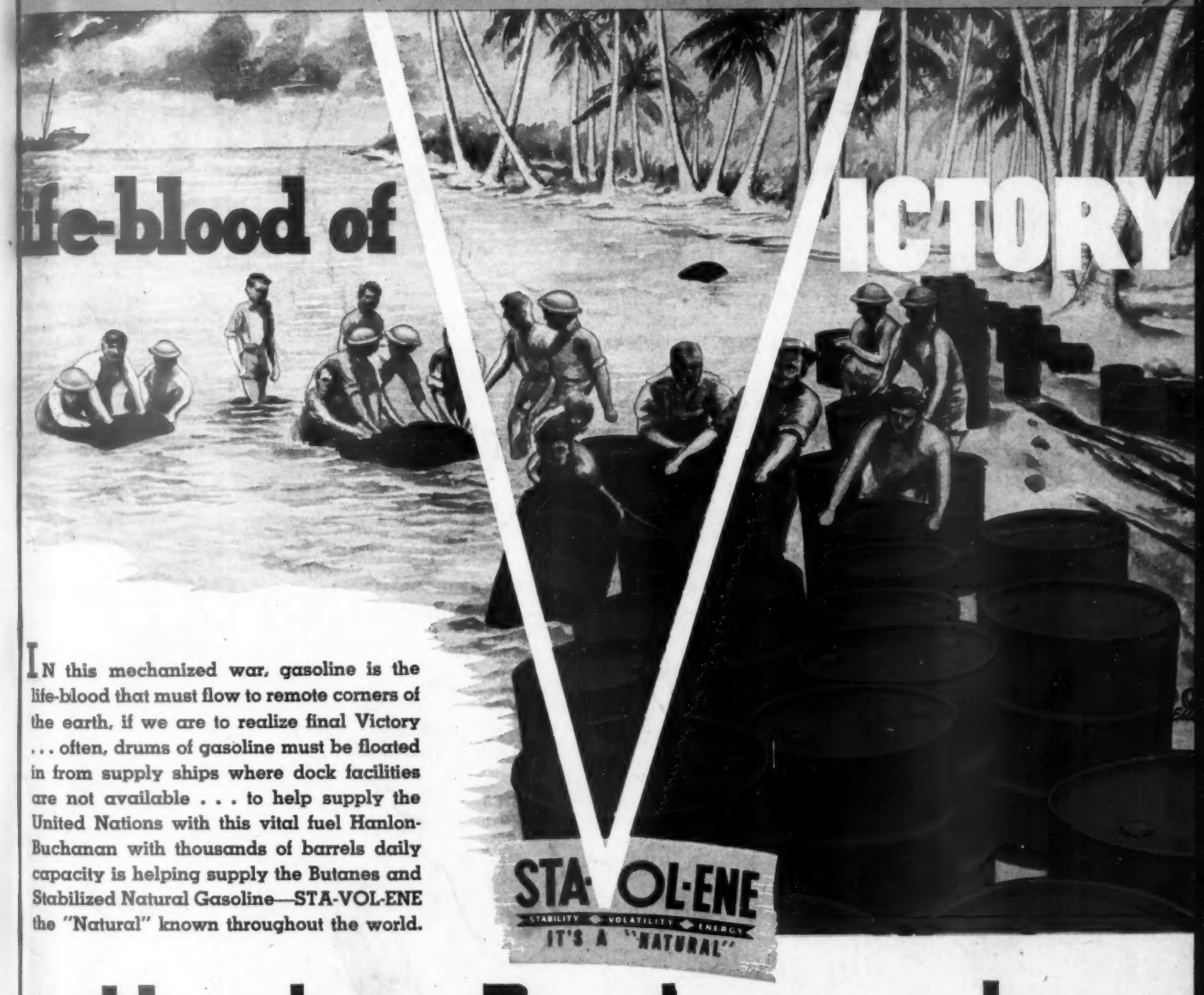


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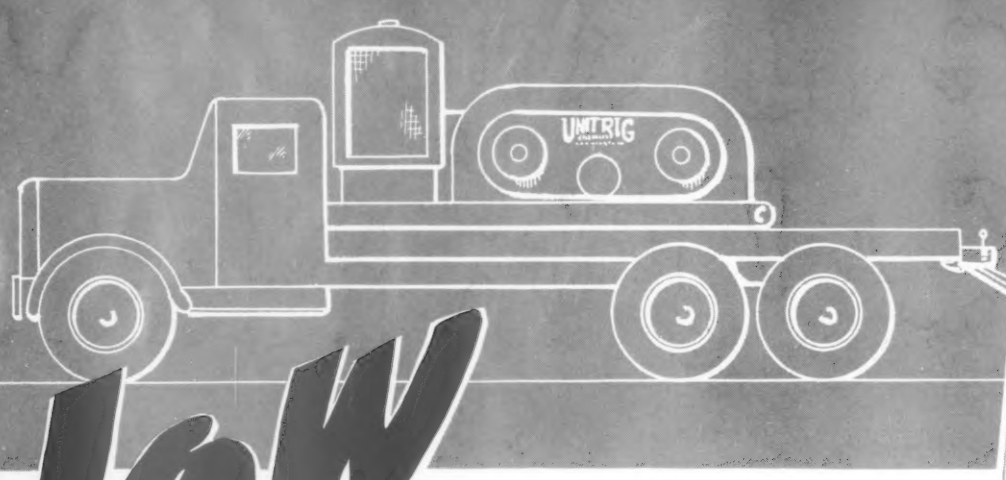


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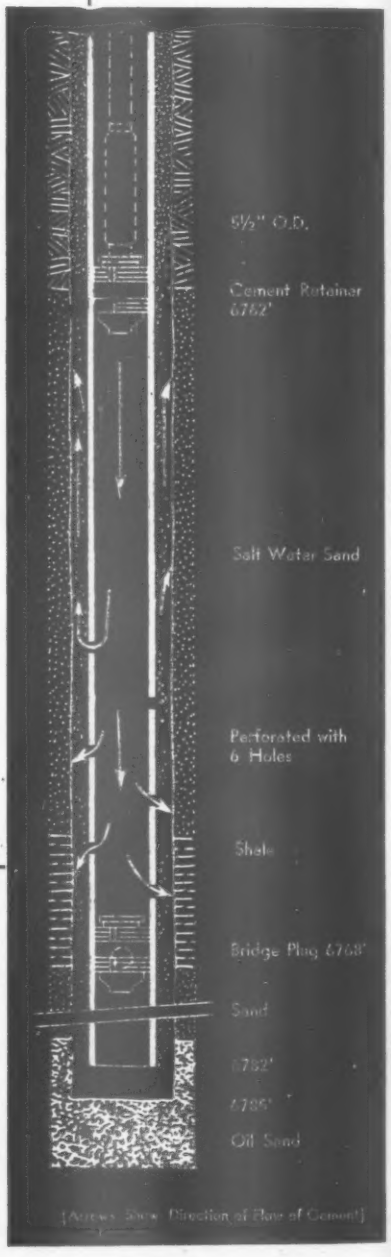
Putting in 10 barrels of water ahead of the cement, the formation took the water at 2100 lbs. per sq. in. A batch of 75 sax of cement was then pumped down and 35 sax squeezed out with a final pressure of 3500 lbs., the excess cement being flushed out with reversed circulation. After drilling out the cement and completing the well again, it came in making 643 barrels of 29° A.P.I. oil with a gas/oil ratio of 350 to 1.

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Progressive operators are depending more and more upon the Baker Cement Retainer to solve their many ordinary and complex problems arising in connection with present day cementing, well repair and well completion operations. If you have not investigated the Baker Cement Retainer, it will pay you to do so now.

*Complete details concerning the many important field applications for this tool will be found on pages 250 to 263 of the 1942 Baker, or Composite, Catalog.*

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# Trends

**Crude-Oil Production By States — Page 92**

**CRUDE PRODUCTION** 3,971,220 bbl. daily average—up 24,625 bbl. One year ago 3,744,310 bbl.

**CRUDE STOCKS** 245,107,000 bbl. as of June 5—down 645,000 bbl. One year ago 254,316,000 bbl.

**GASOLINE STOCKS** 82,205,000 bbl. as of June 5—down 1,732,000 bbl. One year ago 93,192,000 bbl.

**RESIDUAL FUEL-OIL STOCKS** 67,210,000 bbl. as of June 5—down 472,000. One year ago 79,806,000 bbl.

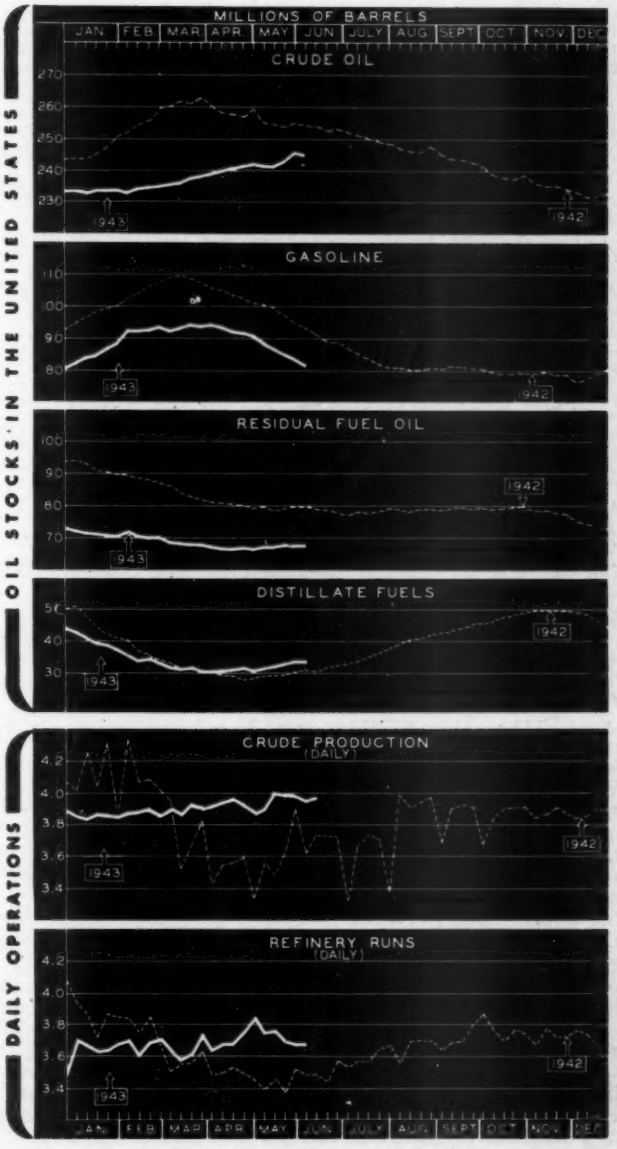
**GAS OIL AND DISTILLATES** 32,577,000 bbl. as of June 5—up 303,000. One year ago 30,604,000 bbl.

**REFINERY RUNS** 3,662,000 bbl. daily week ended June 5—down 200,000. One year ago 3,462,000 bbl.

AN acute shortage in third grade gasoline has developed particularly in areas where agricultural demands are heavy at this season of the year. According to refiners and marketers familiar with conditions, this development has been brought about largely through existing price ceilings applying to several gasoline and naphtha fractions and the changed buying habits of consumers. In the period immediately preceding the war a representative division of retail sales of domestic motor fuels was: premium Ethyl, 10 per cent; regular branded grades, 75 per cent; and third grade, 15 per cent.

AT this time the division in gasoline sales is: premium Ethyl, 20 to 22 per cent; regular, 71 to 73 per cent; and third grade, 5 to 8 per cent. The growth in premium sales is partially due to the increased military demands and in part to the expanding demands of civilians for the best grade of motor fuel available to them. It is explained that with rationing civilian users favor the premium grade apparently due to the belief that they secure better mileage. The fact that there has been a lowering of the octane ratings of the regular fuels is also a factor in the shift to the premium material.

THE net result has been that many refiners, to meet the demands for the premium fuels, have changed their operations to secure greater yields. This has been accomplished in some cases by reforming part of the former third-grade cut to secure high-octane fractions. This trend has been given impetus due to the enlarged demands and favorable prices prevailing for special naphthas. A refiner is able to reform the light ends of his former third-grade gasoline and sell the remaining heavier fraction as naphtha. This causes a shortages of the third-grade material which is widely used by farmers as tractor fuel and by station operators serving customers who have cars that give satisfactory performance with the lower-octane gasoline. There is no easy solution to the problem in supply that has been created. Changes in price ceilings which would be more favorable to the lower-octane fractions have been suggested. A general lowering in octane ratings of all gasolines used by civilians has also been under consideration by representatives of war agencies who have pointed out that as the production of aviation gasoline expands over the balance of the year, high-octane fractions suitable for blending with civilian motor fuels will decrease in volume.



# Decisions Due Soon on PAW Request for Oil-Price and Rationing Powers

WASHINGTON, D. C.—Requests for basic changes in the national administration of the petroleum industry this week awaited official action. Pleas for assignment of authority to the Petroleum Administration for War over oil prices and distribution, including rationing, were in the hands of Donald M. Nelson, chairman of the War Production Board, and of James F. Byrnes, director of the Office of War Mobilization.

Which will be favored in PAW's dispute of long standing with OPA and exactly when decisions will be made are, at the moment, pure speculation.

Meanwhile, Administrator Ickes filed a formal request with OPA asking reconsideration of that agency's rejection of a recommendation for an average increase of 35 cents per barrel in the ceiling prices for crude oil. Administrator Ickes admitted that the request for reappraisal of the price recommendation had been delivered to OPA. He persisted, however, in his previous position that the communication is now property of the OPA and that disclosure of the text should come from the office of Prentiss E. Brown, director.

### Request Being 'Threshed Out'

The request for authority over rationing of petroleum products was filed late last week with WPB Chairman Nelson. A spokesman in the WPB office said the request was being "threshed out" and indicated that a decision could be expected soon. As currently organized, petroleum rationing authority is divided between OPA and the Office of Defense Transportation which exercises jurisdiction over commercial and transport trucks. Still another agency, making four in all, was reported this week to have made a bid for petroleum-rationing powers. The latest entry is the Office of Civilian Requirements, recently created within the framework of WPB. OCR was said to have recommended withdrawal of authority over petroleum rationing from OPA but, it was understood, the new agency recommended that oil distribution be delegated to it as part of its duties, leaving ODT to handle the commercial allocations.

Petroleum Administrator Ickes compares the supplies of petroleum in the shortage areas to a bank account. Repeatedly, he has charged OPA with overdrawing because of laxity in the rationing system. Forged coupons, black-market trading and general laxity in enforcement operations have contributed to OPA's inability to keep actual distribution within the limited gallonage certified as available for rationing by PAW.

Furthermore, Mr. Ickes argued last week, that it does not seem logical that OPA should be the agency to decide the rules and regulations for rationing and price control. Especially, when such rules and regulations are based on information gathered by PAW and transmitted to OPA in the form of recommendations. He intimated that recommendations of the PAW had not been followed in several cases.

### Breach Widening

The breach between PAW and OPA has widened in recent weeks since the latter bureau declined to accept the recommendation on higher crude-oil ceilings which was made as a means of encouraging and stimulating new drilling in search for additional reserves. OPA's counter proposal of a subsidy for wildcat drilling with the Government to receive a quarter interest in all successful wells has been roundly condemned by the industry.

Deferment of any reduction in the motor-fuel rations for Middle West drivers until September at the earliest was virtually promised by Administrator Ickes. Appearing before an informal group of eastern congressmen, he said that a reduction in coupon values in the Middle West would serve no useful purpose until more transportation facilities are available. He said that no additional tank cars for moving petroleum to the East Coast would be available until the 24-in. crude line is completed around September 1.

### Transport Still Taxed

At approximately the same time, although Secretary Ickes did not mention it, the 20-in. products line will be completed to Norris City, Ill., and transportation facilities now moving crude by rail to the East Coast are earmarked for product service until the eastern extension is finished early next year. Mr. Ickes has taken the stand that further reductions in consumption in other parts of the country, particularly the Middle West, will be imposed as soon as transportation permits movement of an equivalent amount to the eastern states.

Nonessential civilian drivers in the eastern states are permitted to use 1½ gal. per week on an A card, and all pleasure driving is prohibited. Pressure groups in the eastern states are said to be exerting all influence possible on PAW and OPA in an effort to spread the hardship, contending, of course, that deeper cuts in other parts of the country would enhance supplies on the East Coast.

# Board to Process Oil-Wage Applications

DALLAS, Tex.—Wage applications of more than 200 oil companies, involving several thousand oil-field workers in Texas, Oklahoma and Louisiana will be processed in the near future. This was promised this week by the Eighth Regional War Labor Board with offices in Dallas after establishment of 44 job classifications within wage brackets for petroleum industry workers.

The region was divided into three areas: (1) East Texas, northern Louisiana and Corpus Christi. (2) North Texas and Central Texas. (3) Southern Louisiana, Houston, Panhandle, Oklahoma and West Texas.

"The minimum and maximum rates for each job classification in each group area are used as a guide for the Regional War Labor Board in granting wage increases up to the minimum rates," the announcement said.

"Under the directive of the economic stabilization director of May 12, clarifying the 'hold the line' Executive Order 9328 of April 8, the 'minimum sound and tested going rates' for particular occupational groups in specified labor areas are the rates beyond which adjustments may not be made, except in rare and unusual cases, for the purpose of correcting gross inequities or to aid in the effective prosecution of the war."

# Instructions Revised on Replacement Rules

WASHINGTON, D. C.—Revised instructions to employers for the preparation of replacement schedules were issued June 15 by the Bureau of Selective Service of the War Manpower Commission, limiting occupational deferment to 6 months of men between 18 and 25 on July 1 who are not fathers, unless the job involved is exceptionally important to the war effort and extremely difficult to fill.

Employers also were instructed, for the first time, to include men with children on their replacement schedules filed on or after July 1, but provided that no such man be scheduled for release before October 1.

Announcing these changes in the manning table instructions, the War Manpower Commission emphasized that they should not be interpreted as fixing a date for the drafting of fathers.

It was pointed out that instructions to employers provide that "single men who are equally replaceable" will be listed for release ahead of men with children and, of course, will be called for induction first. Moreover, it was stressed that the replacement schedule will list only the comparatively few "key men" in essential industries, and the handling of these cases does not necessarily indicate when fathers in general will be called. The main effect of the instructions, it was stated, is that fathers in "key" positions listed on replacement schedules will have to justify their continued deferment after October 1 on the basis of occupational rather than on their family status.

Instructions for the preparation and filing of replacement schedules are contained in two memorandums sent by the Selective Service Bureau of the War Manpower Commission to all Selective Service state headquarters and local boards. They are identified as Selective Service Local Board Memorandums 158 and 158-A. The latter is of major interest to employers of registrants and is entitled: "Instructions to Employers for Preparation of the Replacement Schedule."

## Illinois' Oil Law Facing Decisive Vote

SPRINGFIELD, Ill.—The latest attempt to enact an oil conservation law was scheduled this week for final decision. Proponents of the measure could muster only 23 affirmative votes in the state senate last week, barely short of a majority, but its sponsors did succeed in defering final consideration. Eight members of the senate either did not vote or were absent last week when the measure failed to receive a majority.

"Conditions have become pretty bad," one of the bill's sponsors declared, "when a great oil state can't get a law in accordance with best conservation practice. Politics is to blame," he added.

Opponents continued to insist that the measure was unsound, was unfair to, and discriminated against, small operators, and tended toward monopoly.

The bill would delegate power to the oil commission to "prevent waste and enforce effectively the provisions of this act." Authority to inspect all oil and gas properties, leases and records would be granted along with powers to regulate secondary-recovery operations; gas-oil ratios; rates of production; location and drilling of wells, and other regulatory functions.

Penalties up to maximum fine of $1,000 for each day's violation of the regulatory law are provided.

### Ashland Superintendent Among Three Fatally Burned

ASHLAND, Ky.—Three men, including Boyd W. Morgan, 44, general superintendent of refining, were fatally burned here June 12 when vapors from a cracking tower at the Ashland Oil & Refining Co.'s Leach plant ignited.

Crosby M. Rogers, 41, maintenance superintendent, and Thomas S. Brown, 38, cracking plant fireman, were the others fatally burned. Paul G. Blazer, president of Ashland, and Harry Blackstone, assistant superintendent, suffered burns about the hands when they attempted to extinguish the blazing clothing of the victims.

Routine inspection of the cracking tower was under way when the accident occurred. When the bottom manhead was opened vapors issued from the chamber and were ignited by a furnace at an adjoining unit. There was no explosion and no serious damage to equipment resulted.

Mr. Morgan had been general superintendent for about 2 years, having previously served the refining industry for 18 years, chiefly with Universal Oil Products Co., Chicago, Ill.

Mr. Rogers joined Ashland 2½ years ago after serving with Pure Oil Co.'s manufacturing department for about 12 years.

## Argentina Initiates Deal for Equipment

ARGENTINA, it was reported in press dispatches this week from Buenos Aires, is anxious to conclude an agreement with the United States for the export of petroleum equipment to that South American country. Segundo Storni, foreign minister under the revolutionary regime, has conferred with United States representatives this week for the purpose of resuming trade.

Argentina, it was reported, will undertake to supply petroleum to several neighboring South American countries, including Uruguay, Paraguay and Brazil as part of the agreement. With portions of Argentina production diverted to its neighbors, compulsory rationing would appear inevitable because the country does not now produce its full requirements.

### Panhandle Oil Price Raised 7 Cents Per Barrel

WASHINGTON, D. C.—An advance of 7 cents per barrel in the ceiling price for Texas Panhandle crude oil was authorized June 15 by the Office of Price Administration.

Ceiling prices are lifted to a top of $1.22 per barrel for 40 gravity and above, scaling down to 80 cents for below 20 gravity. The higher prices, effective June 16, will lift Panhandle crude, OPA said, to levels comparable with maximum prices for other crudes of similar quality. OPA estimated the net increase to operators, on the basis of current production of about 91,000 bbl. daily, would be about $1,500,000 annually.

### Allies Maintain Rubber Stocks Above "Minimum"

WASHINGTON, D. C.—Minimum reserves of rubber supplies are still intact in the United States and the British nations.

Meanwhile, William M. Jeffers, rubber director, reported that domestic production of synthetic rubber this year will be approximately 275,000 tons and that the manufacturing rate is growing rapidly enough to begin building up rubber stockpiles by the end of the year.

# Standard of California and Navy Defend Propriety of Elk Hills Contract

WASHINGTON, D. C. — Suspicious members of Congress think they smell a first-rate scandal in a plan for development of Naval Petroleum Reserve 1 in Kern County, California, covered by a contract between the Navy Department and the Standard Oil Co. of California which has been in effect since November 20, 1942.

Although the existence of the contract and its general terms have been known for several months, it is suddenly being described by some as "another Teapot Dome," presumably on the assumption that anything involving Navy oil lands and a major oil company is bound to be the subject of a plot.

The contract first came to public attention on March 3, 1943, when the House committee on appropriations reported a supplemental appropriation bill for the Navy Department after deletion of an item of $2,900,000 recommended by the Budget Bureau for operation of naval oil reserves. The committee made no explanation of this omission, but the hearings on the bill, released the same day, revealed that Rear Adm. H. A. Stuart, director of naval petroleum reserves, had explained in some detail the plan worked out with Standard of California for joint development of the Elk Hills field.

**The Navy Department and Standard Oil Co. of California joined last week in defending the contract covering development and production from the Elk Hills Naval Reserve 1 which came under scrutiny of Congress and the attorney general's office. This article reviews salient features of the contract and explains its provisions for production of 15,000 bbl. per day for 5 years.**

### Chairman Investigating

Rep. Harry R. Sheppard of California, chairman of the subcommittee on naval appropriations, recommended that the appropriation go over to a later naval bill while he investigated the contract.

In the course of Representative Sheppard's investigation the contract came to the attention of the Department of the Interior, apparently for the first time, and certain criticisms were raised. It was then referred to the Department of Justice which made an analysis of the contract and will report to the president shortly. Meanwhile the Navy Department withdrew its request for an appropriation of $1,748,000 to pay Standard of California the cash settlement specified under the contract. However, the contract is still in effect and Standard is operating under it without receiving the payment.

Last week Sen. William Langer of North Dakota made a speech denouncing the contract, Rep. Jerry Voorhis of California issued a statement in similar vein, and Rep. J. Hardin Petersen of Florida, chairman of the House committee on public lands, announced his committee would conduct an investigation.

### Contract Terms Complex

The terms of the contract are rather complex, but it would appear, at least superficially, that the Navy is getting the better of the deal in the long run, and that while there will be some increase in the production of much-needed heavy crude during the next 5 years, the Navy is determined to save the bulk of its Elk Hills reserve for later requirements.

Land ownership of the Navy and Standard of California is checkerboarded through most of the reserve, and there has been an unofficial truce on new development. Under the contract now in question, the Navy and Standard attempted to place dollar values on their holdings, equipment, and development work and to pool their operations. It developed that Standard's share was 36 per cent of the total and the Navy's share was 64 per cent, and it was agreed that for the next 5 years Standard would produce 15,000 bbl. per day, of which 64 per cent would be considered Navy oil. At the end of 5 years Standard is to repay this oil to the Navy out of one-third of its share of production, which may be limited to 750 bbl. daily.

Conclusions drawn by Senator Langer were rejected by a Navy spokesman who said that the Elk Hills deal was a good one for the Government and, from its conservation aspects, for the national interest. The spokesman said that the agreement gave the Navy control of 95 per cent of the oil in the Elk Hills reserve and that only 5 per cent was subject to current exploitation. If the agreement had not been made, he said, the Standard of California could have forced exploitation of most or all of the reserve at any time. Reference obviously was to a previous covenant under which Standard of California and the Navy agreed to refrain from development of the reserve, except by granting the other party at least 6 months' notice.

Negotiations between Standard of California and the Navy culminating in the agreement now under attack were started in 1938, shortly after Congress authorized the secretary of the Navy to institute proceedings to conserve Naval Petroleum Reserve 1 for Navy purposes. In an effort to obtain data permitting a proper evaluation of the respective holdings in the reserve, an exploration program was outlined. Standard of California drilled 12 wells on its 8,300 acres in the reserve at a cost of about $2,000,000. Navy Department applications for funds to carry on its phase of exploration were rejected.

### First Proposals Rejected

Next, Standard of California offered to develop both company acreage and the Navy's property, accepting cost of exploitation of the government land out of production. This was rejected. Standard of California then placed a net value of $146,500,000 on its holdings both within the reserve and on the east side, outside the reserve. The Navy rejected the valuation figure and proposed to pay $20,000,000 with a "royalty" accruing to Standard of California in production from its holdings if yields from company fee lands exceeded that figure.

Irreconcilable differences in the company and government valuation figures eventually led to the agreement which became effective November 20, 1942, the principal features of which follow:

1. Standard of California conveyed all of its lands to the Navy, consist-

*(Continued on Page 44)*

# THIS WEEK

**PRICES**—PAW representations for reconsideration of crude-advance recommendation goes to OPA. . . . Administrator Ickes refuses to disclose text of communication, repeats stand it's up to OPA to make it public. . . . Ickes prepared to carry plea to James Byrnes, director of war mobilization, if OPA remains adamant. . . . ¶Sumner T. Pike avers that industry's market structure has risen automatically, by normal expiration of low-price contracts, renewal at permitted ceilings. . . . Claim denied by industry spokesmen, except on gasoline. . . .

**RATIONING**—Deflation of coupons in Middle West still pending. . . . Involves ability of transportation facilities to move more oil to Atlantic seaboard. . . . Movement east appears about static, by present facilities. . . . Changed situation pends completion of big-inch lines, both crude and product. . . . ¶Administrator Ickes asks WPB Chairman Nelson for power over petroleum rationing. . . .

**REFINING**—District 1 refinery quotas for June advanced 31,000 bbl. daily. . . . Most of increase assigned to Standard Oil Co. of New Jersey plant at Bayonne, where new processing facilities are now on stream. . . . ¶Vapor flash fatally burns Boyd Morgan, general superintendent of Ashland Oil & Refining Co., two fellow workers. . . . ¶Gulf Coast refiners want runs increased, contend stocks are below efficient operating level, preventing maximum war service, threatening more critical repercussions. . . .

**TRANSPORTATION**—Break in big-inch line, flood waters, estimated to have cut deliveries to East Coast 1 3/4 million barrels. . . . ¶Larger diameter for Stanolind Pipe Line Co.'s West Texas line, extension to St. Louis, advocated by District 2 oil men. . . . Shortage of 100,000 bbl. in daily refinery requirements forecast within a year, seek to supplement available crude by Texas line. . . . ¶Steady progress reported on eastern extension of crude line, also on products line from Texas. . . .

**ADMINISTRATION**—Congressmen attack Standard Oil Co. of California and Navy Department operational contract at Elk Hills, Naval Reserve 1. . . . Both parties defend deal as "good" one, for all concerned, including public. . . . ¶Rumors of top personnel changes in PAW Districts 2 and 3 neither denied nor confirmed. . . . ¶Maj. J. R. Parten, now PAW transportation director, slated for assistant deputyship to coordinate transportation, marketing and distribution, when his successor is appointed. . . . ¶Argentina's new revolutionary administration initiates negotiations for more American oil-field equipment. . . . Shipments practically nonexistent during "rule of prudence," including friendly relations with Axis. . . .

**MANPOWER**—Forty-four job classifications created by Eighth Regional War Labor Board, Dallas, for processing wage applications of 200 oil companies. . . . ¶Changes made in replacement schedules, for Selective Service guidance, generally tightening deferments. . . . ¶Action expected soon on PIWC application for adjustment machinery in supervisory personnel salaries, on basis of 48-hour week. . . .

**SUPPLIES**—East Coast stocks recede to 25.6 per cent of normal, only 0.1 point above the all-time low. . . . ¶Diesel oil, tractor fuel, third-grade gasoline particularly short in the Mid-Continent. . . . ¶Germany reported, by foreign agents, dipping into reserve stocks of aviation fuel, accounting for inactivity of air force. . . . ¶Intensive investigation under way in all PAW districts to determine available crude a year from now, possibly linked with new appraisal of necessary drilling equipment, prices. . . .

*Guard towers and armed watchmen on the alert are wartime additions to the petroleum industry. Symbolic of the current necessity for plant protection is this picture made at one of the vital war-product refineries near Beaumont, Texas Gulf Coast*

# How Continental Oil Co. Trains Women Laboratory Workers

PONCA CITY, Okla.—One of the latest departures from prewar customs is Continental Oil Co.'s program of training and employing women as testers in the control laboratory of its refinery here.

Here, in a modern laboratory, 28 women graduates of a rigorous training course are satisfying their desire to "do something" in the war effort. Through study and actual practice they are now making tests to assure uniformity in quality of products used in the fighting machinery of America and other Allied nations—working in 8-hour shifts both day and night.

These 28 women now actually at work in the control laboratory were selected from the first two classes to complete Continental Oil Co.'s training course. Other classes are now in progress of training.

It was soon after the attack on Pearl Harbor that Dan Moran, Continental president, started plans to alleviate the increasing shortage of manpower. Included was the program to train women as laboratory testers. A special laboratory with modern equipment was established for this purpose. Inasmuch as women, other than stenographers, had not previously worked in the refinery it was necessary also to erect a building containing locker, shower, and dressing rooms for the special use of the new contingent.

Public announcement that Continental Oil Co. would train and employ women as testers proved to be as attractive as a dollar-day sale . . . they literally swamped the personnel division. For 2 weeks their applications were received . . . only 135 were given the rigid examination required for candidates.

After examination papers had been graded, women with highest ratings were interviewed by a committee comprising L. L. Davis, supervisor of processes for Continental; Dr. B. H. Lincoln, chief chemist, and A. H. Erwin, chief tester in the Ponca City control laboratory. This committee selected 15 candidates for the first class . . . second and third classes started a short time later.

### Length of Course

The study outlined for women testers compressed into a 6-week course what had previously been equivalent to a 2-year college course, or a year's apprenticeship. Supervisor and teacher of the classes is Mr. Erwin, veteran of 20 years in the control laboratory,

***Above: Miss Betty Siler, assistant computer with a seismograph crew, at work in a temporary field office. Three such crews now employ women as assistant computers***

***Above: Women trainees for jobs as testers in the refinery hearing lecture by A. H. Erwin, control chemist. Left: New control laboratory at the Ponca City refinery, with women on the job following graduation from training course***

and a former chemistry instructor in college extension work.

College work cannot be remotely compared to the training to which these women's classes are subjected. Instead of the usual 15 or 16 hours of class work weekly which the college student experiences, the future testers put in a 40-hour, 5-day week. They attend classes from 7 a.m. to 3 p.m. 1 week . . . from 3 p.m. t. 11 p.m. next week.

Each woman completing the training course costs the company $300 in addition to training pay . . . plus the gift of three attractive blue denim uniforms . . . and a textbook. This book, the "American Society for Testing Materials" manual, is the guide of all laboratory workers.

The first two hours of each 8-hour class session are devoted to a lecture by Mr. Erwin or one of his three assistants, M. D. Porter, R. E. Beattie and N. K. Edwards, of the control laboratory staff. These lectures explain tests to be made later in the day, answer questions on current assignments, and review work that has gone before. On the bulletin board is posted a daily work sheet assigning tests for each student.

### Practical Testing Program

Following the lecture period, the women go to their testing tables and spend the remainder of the day making tests which are the same as those they will conduct in regular work in the control laboratory following their graduation. Frequent repetition of these tests makes for accuracy.

Accuracy is a "must" in the control laboratory. Here a sample of every product is checked for uniform quality on every one of its 25 or more complex steps toward tank-car and shipping case. A sample of each finished product is then filed and catalogued in the "retain" room of the control laboratory, as a check against the possibility of contamination in transit or in storage.

So important is this phase of manufacturing operations that a tester must exercise delicate precision in every computation and the new women testers are meeting the exacting requirements of the job in full measure.

A review of personnel records of a few of the women testers will reveal why they have gone to war in the control laboratory.

Mrs. Jimmye Peters is typical of the group. Her husband is serving in the Merchant Marine. She applied for a tester's job because she wished to augment government income while her husband was away . . . but mostly because she "wanted to do something in the war." She had slight knowledge of chemistry, but her determination to master the course carried her near the top of her graduating class.

### Husband and Brother in Army

Mrs. Josephine Willerton has a husband and a brother in the Army. Her father is in war work, too. Her husband, W. R. Willerton, was formerly employed in the mechanical division of Continental's Ponca City refinery. Her father, H. J. Hill, a former employe in the warehouse of the refinery, is employed by a construction company building a gasoline plant in Aruba, Netherlands, West Indies.

Then there are Mrs. Beulah Wiley and Mrs. Marian Stevens. Mrs. Wiley's husband is in the Army. Three of her brothers, including Wayne Adkins, a former employe in Continental's laboratory, are in the Navy. Her father, C. L. Adkins, is a tank-car inspector in the Ponca City plant. Mrs. Stevens has two brothers in the Navy. He father is helping to build the WEP 24-in. line which will move crude oil from Texas to the East Coast. Her mother is working in a powder plant in Arkansas.

Although woman's invasion of the Ponca City refinery is new . . . there are others in Continental Oil Co. doing man's work. Since Pearl Harbor the company has hired well over 500 women, many performing jobs hitherto done by man.

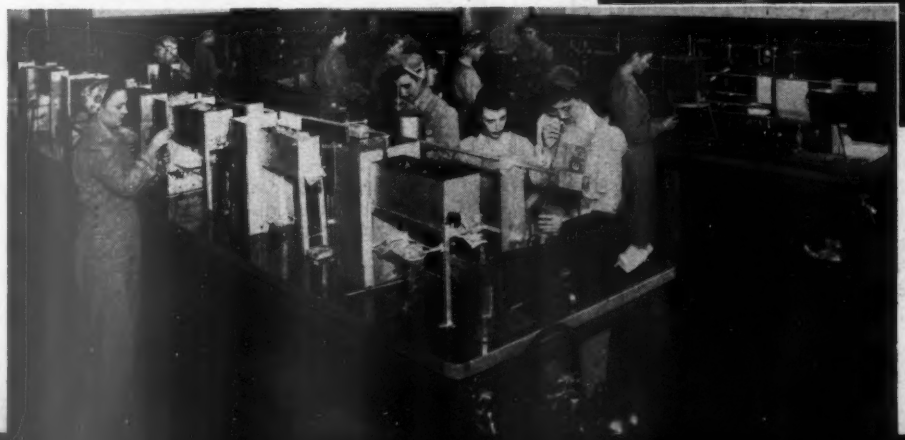
For instance, three of the company's seismograph crews now employ women for the first time as assistant computers. These crews, which scientifically map oil structures, travel from one location to another, wherever the search for new crude oil production may lead. The women computers travel with the crews and work in temporary field offices. Their duties include the labeling and cataloguing of data incidental to calculations of structures from the seismograph records.

The mailing and stationery division, which formerly employed 1 woman stenographer, now has 7 women on a staff of 13. Two run ditto machines, one each is assigned to operation of multilith and addressograph machines, and two are stationery clerks.

Men formerly predominated in the pay-roll division and the order and distribution division. Both staffs now include several women workers.

So it is all around Continental Oil Co. In the land department where a woman draftsman labors, in the personnel division where a woman does fingerprinting and photography, in the engineering division where women are file clerks. Everywhere women are picking up the tools men have laid down and they are turning out production.

*Right: Here are seen Mrs. Josephine Willerton and Mrs. Dolores Weaver making practice tests as a part of their training course. Mrs. Willerton has a brother and husband in the Army, while her father is working on construction of a refinery in Aruba, West Indies*



*Left: Women at work in the laboratory especially established for the training course, performing practice tests on fuels and lubricants*

# Geophysics Company Stresses Necessity of Finding Oil to Reduce Personnel Losses

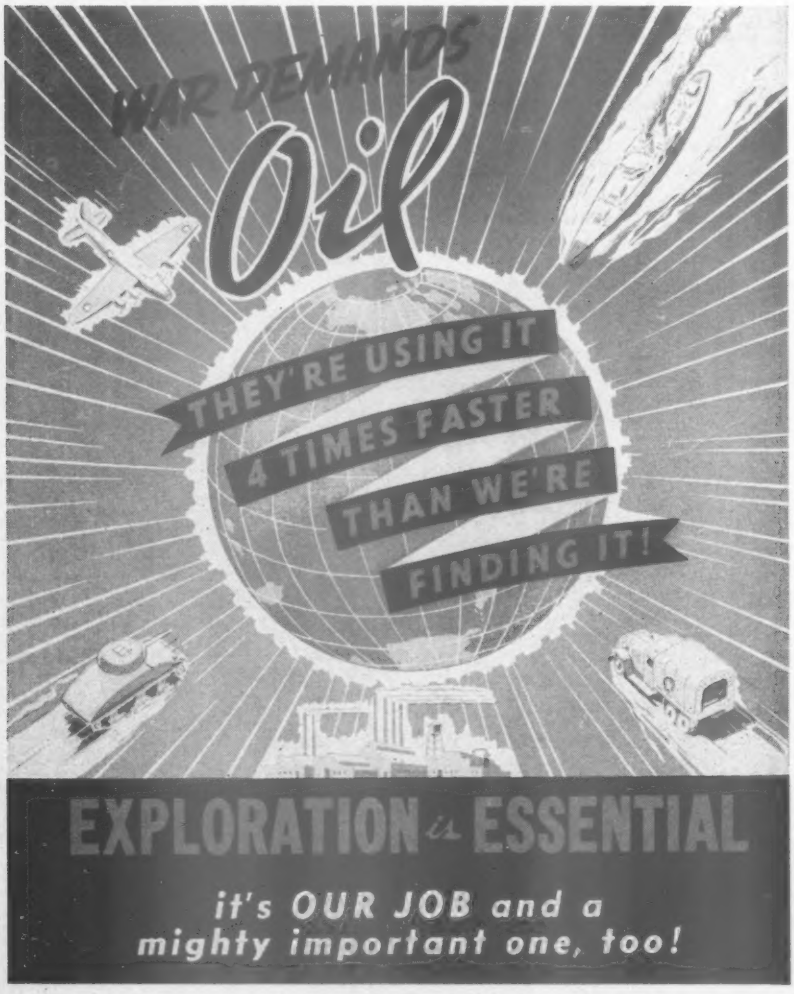
*by Harry F. Simons*

DALLAS, Tex. — After wrestling with the problem a short time, one service company, engaged principally in geophysical exploration for oil-bearing structures, took the offensive and has embarked on an advertising and publicity campaign to inform both the public and its employes on war necessity for this type work. Just to round out the campaign, the company has also taken the matter up with the national housing administration to get the same consideration for its employes that is given workers in the more obviously defense industries.

The method has been successful enough that other companies engaged in a similar line of work are also developing their own methods for informing employes and public on a vital problem. The company inaugurating the advertising and publicity campaign is the Geophysical Service, Inc., which has seismograph crews and equipment operating in the United States and foreign countries with a field personnel totaling around 250 men.

The advertising and publicity effort includes posters on company property and equipment pointing out to the men that the work they are performing is vital to the war effort. Advertisements are used in local newspapers in the area in which seismograph crews are at work, and articles in local newspapers tell that geophysical prospecting for oil is in progress in the neighborhood, the necessity for such work, and the name of the company doing it.

Two conditions brought on the educational campaign through the posters and the newspapers. The first was the tendency of some of the seismograph-crew members to undervalue the work from a defense standpoint. The other was desire of many to become members of the armed forces.




*Type of poster used on equipment and in advertising copy*

### Posters Tell Story

The second condition was an aggravation of the first. It was the total lack of understanding on the part of the general public of the importance of petroleum and its products in the war effort and of the crude-oil reserve and supply situation.

When a farmer found a seismograph crew working on his land and noticed that at least part of them were young, strong and healthy he was inclined to be critical, particularly if he had sons or relatives in the service.

Criticisms were not limited to farmers but often the general public misunderstood the work of the crews.

From the standpoint of the seismograph companies, the personnel problem is a severe one because they have been ordered to expand their activities and to do so requires skilled workmen. Qualifications for a party chief include a college degree in engineering or in science plus a minimum of 3 years' experience in the field. Computers must have the same type of college degree and 18 months as an assistant. The observer must likewise be a college graduate in engineering or science and have 1 year's training as an assistant observer. The surveyor must have college training or have served at least 1 year as an instrument man on a survey party. The rodman, driller and shooter re-

quire a high-school education but the shooter must have served as a shooter's helper for at least a year and the driller must be an experienced mechanic with 3 years' experience helping on the drilling machine. These are minimum requirements and finding or training of a replacement for even the least skilled is difficult under existing manpower conditions.

The first of the posters (which are 12 by 15 in.) issued in the campaign was in four colors and carried the message that petroleum was being consumed in the war effort four times faster than it was being found. It also pointed out that exploration is essential, that it is the job of the seismograph crews to locate drillable structures. The second poster carried the message that the planes must have oil to keep them flying and that it is the job of the seismograph crew to find it. The third poster is being printed and it shows some of the more essential uses of petroleum, some of the quantities needed on the numerous war fronts, and also points out that the discovery rate is way behind production and consumption. Many of the trucks carry the posters on them so as to insure their coming to the attention of the personnel.

### Importance of Work Explained

Newspaper advertisements include a black and white reproduction of the posters plus a short message as follows: "A Geophysical Service, Inc., seismograph survey crew is operating in this vicinity. Help these men all you can, they are engaged in the highly essential and specialized work of exploring underground formations for new oil reserves — oil reserves which are vitally needed by the armed forces of the United Nations in their drive to victory."

The news article in the same paper brings out the importance of oil in the war, necessity of finding new reserves, the part seismograph plays in finding new oil, the record of the company in finding new pools and the necessity of trained technical personnel for geophysical work.

Difficulties of the men finding quarters because they were not connected with a defense industry led Geophysical Service to write the regional representative of the National Housing Administration and to PAW officials who in turn communicated with the National Housing Administration regional office. When the regional representative of housing administration learned that the seismograph exploration companies were operating on a priority as high or higher than many defense plants and that official Washington considered it absolutely essential to the war effort, members of the geophysical crews were able to compete for housing facilities on an even basis with workers commonly considered in the defense category.

# Federal Order Digest

### WPB Regulations

**Preference Ratings**—CMPR 5, Direction 3: Provides that orders need not be downgraded on maintenance, repair and operating supplies, if placed prior to May 16, 1943, when certain industries were reclassified, issued June 9.

**Processing Facilities**—PR 3, amended: Provides uniform methods of applying ratings to obtain preferential use of processing and fabricating facilities, issued June 7.

**Preference Ratings**—CMPR 3, Interpretation 2: Prohibits use of ratings indiscriminately to compel suppliers to furnish manufacturers with products for resale which they normally are able to produce themselves, issued June 8.

**Export**—PR 9, amended: Specifies use of Form WPB-743 (formerly PD-311 Revised) for filing export applications, covering critical materials, issued June 7.

**Bills of Materials**—New instruction booklet issued, superseding General Instructions on Bills of Materials, published November 14, 1942, simplifying procedure, issued June 8.

**Chemicals**—Monthly allocation for June by Chemicals Division, distributes chemicals valued at $87,500,000. Fifty-one per cent went for direct military consumption and 19 per cent for indirect military application, issued June 8.

**Aluminum Rivets**—Warehouses established to provide for needs of consumers requiring aluminum rivets in amounts smaller than the minimum mill runs, issued June 9.

**Preference Ratings**—PR 1, amended: Restores rating of AA-2 in order to avoid creation of a new "super" rating; provides a bracket between AA-1 and AA-2X, issued June 9.

**Burlap Bags**—CO M-221, amended: Relaxes prohibitions in number and quality of products which can be packed in burlap bags, reflecting an improvement in supply, issued June 11.

**New Automobiles** — CO M-216, amended: Clarifies "rust inhibiting oil" as used in the order to mean a product complying with specification "CRC Designation L-7-443," published by Cooperative Research Council; requires report from holders of new cars to regional WPB offices, issued June 11.

### Manpower Regulations

**Replacement Schedules**—Limits occupational deferment to 6 months of men between 18 and 25 who are not fathers, unless job involved is exceptionally important, effective July 1.

### OPA Rationing Orders

**Commercial Mileage** — Establishes new TT coupon, effective July 1, except in northeastern shortage area where old T coupons are valid through July 15.

**Tires and Tubes**—RO 1a, Amendment 33: Eliminates some of the inventory reports and records previously required; reduces frequency of some of the remaining reports, effective June 7.

**Fuel Oil**—Advises consumers to return applications for rations promptly to local boards, sets up table of valid dates for new coupons, issued June 13.

### OPA Price Regulations

**Newsprint**—MPR 130, Amendment 3: Fixes specific dollars-and-cents ceilings for other than standard nondutiable sizes, effective June 8.

**Steel Valves**—SR 1, Amendment 12: Exempts steel valves, valve parts and subassemblies as well as operations performed in the processing, machining, welding, treating or finishing of these products from price control, to facilitate production, effective June 7.

**Heavy Steel**—RPS 49, Amendment 16: Fixes dollars-and-cents ceiling prices for prime quality, heavy-steel products sold by heavy line warehouses in six newly created pricing zones, effective June 10.

**Freight Rate Reductions**—MPR 136, Amendment 90: Extends freight rate reductions of ICC on May 15 to certain formula-priced items of machinery, parts, farm equipment and ferrous forgings, effective June 8.

**Containers**—MPR 170, Amendment 5: Permits collection of a container deposit when antifreeze is sold on a container-returnable basis, effective May 22, issued June 12.

**Blitz Cans** — GMPR, Amendment 54: Establishes pricing procedure for sale of Army rejects, effective June 9.

**Appointment**—Lester V. Chandler as price executive of the OPA rubber branch.

### Alien Property

**Sales**—Establishes rules by which Custodian Leo T. Crowley will offer alien patents for sale.

### ODT Regulations

**Fuel Preference Ratings**—Sets up degree of essentiality among industries to be accorded preferential treatment in the eastern gasoline shortage area, issued June 7.

**Commercial Vehicles** — ODT 21, Amendment 7: Relieves commercial motor-vehicle operators from signing receipts for gasoline, parts, tires or tubes and endorsing the receipt with their Certificate of War Necessity number, effective June 10.

# District 1 Refinery Quota Increased 31,000 Bbl. Daily

NEW YORK.—An increase of more than 31,000 bbl. in daily runs of crude oil to stills at District 1 refineries in June is provided in daily quotas assigned last week by the Petroleum Administration for War. Daily quota for the district was increased to 551,600 bbl. compared with 520,439 in May.

An increase of 23,800 bbl. assigned to Standard Oil Co. of New Jersey's plant at Bayonne, N. J., was the most substantial change. Smaller increases were assigned to Gulf Oil Corp. at Philadelphia, Pa.; American Bitumuls Co., Baltimore and Providence; Mexican Petroleum Corp., at Savannah, Ga.; Pan American Refining Co., Baltimore, Md.; Standard of New Jersey at Baltimore and Cities Service Oil Co. of Pennsylvania at East Braintree, Mass. Downward adjustments were topped by a 3,000-bbl. cut for Colonial Beacon.

DISTRICT ONE REFINING QUOTAS

| | Plant location | June quotas | May quotas |
|---|---|---|---|
| Mexican Petroleum Corp. | Savannah, Ga. | 1,766 | 1,642 |
| Continental Oil Co. | Baltimore, Md. | 7,000 | 7,000 |
| Pan American Refining Co. | Baltimore, Md. | 2,360 | 1,550 |
| Colonial Beacon Oil Co. | Everett, Mass. | 26,297 | 29,902 |
| Tide Water Associated Oil Co. | Bayonne | 54,000 | 54,000 |
| Atlantic Refining Co. | Philadelphia | 80,000 | 80,000 |
| Sinclair Refining Co. | Marcus Hook | 44,000 | 44,000 |
| Sun Oil Co. | Marcus Hook | 70,334 | 70,334 |
| Gulf Oil Corp. | Philadelphia | 41,000 | 35,380 |
| Gulf Oil Corp. | Staten Island | *8,165 | 8,165 |
| American Bitumuls Co. | Baltimore | 2,200 | 1,936 |
| American Bitumuls Co. | Providence | 1,400 | 170 |
| Standard Oil Co. of N. J. | Bayonne | 108,892 | 85,096 |
| Standard Oil Co. of N. J. | Baltimore | 21,793 | 20,428 |
| Standard Oil Co. of N. J. | Charleston | *3,803 | 3,803 |
| Cities Service Oil Co. (Pa.) | Linden | 13,000 | 13,000 |
| Cities Service Oil Co. (Pa.) | E. Braintree | 15,000 | 12,500 |
| Cities Service Oil Co. (Pa.) | Petty's Island | 10,000 | 10,933 |
| Socony-Vacuum Oil Co. | E. Providence | 3,500 | 3,500 |
| Socony-Vacuum Oil Co. | Paulsboro | 18,500 | 18,500 |
| Socony-Vacuum Oil Co. | Brooklyn | 18,600 | 18,600 |
| | | 551,610 | 520,439 |

*June quotas unspecified but assumed to be unchanged from May.

## Germany Reported Drawing On Reserves of Plane Fuel

WASHINGTON, D. C.—Germany is beginning to draw aviation motor fuel from reserve supplies, according to reports of agents to Kilsoo K. Haan, registered here as a representative of the Korean National Front Federation and the Sino-Korean Peoples' League.

This report, credited to Lt. Gen. Kisaburo Ando, president of the Imperial Rule Assistance Association, the Nazi party in Tokyo, was advanced as the reason why many of Germany's air force are grounded. The Japanese leader is said to have made the aviation-gasoline report to 52 high-ranking military men and 10 civilian officials from the Home and Foreign Ministry.

Considerable credence is assigned to reports of Mr. Haan's organization because of a record of amazing accuracy on numerous previous developments, although the simple fact that he is registered as an alien agent is not an endorsement by the U. S. Government.

## Colombian Productions Continues Low

Crude-oil production in Colombia totaled 350,367 bbl. in April, an average of 11,679 bbl. per day. This compares with a total of 491,656 bbl., an average of 15,215 bbl. per day, in March and with a total of 1,072,000 bbl., an average of 35,733 bbl. per day, in April 1942.

For the first 4 months of this year Colombia's crude-oil production totaled 1,384,766 bbl. against 6,917,000 bbl. in the same months of 1942.

A comparison of production by months for the first 4 months of the 2 years follows:

| Month— | 1943 | 1942 |
|---|---|---|
| January | 208,532 | 2,213,000 |
| February | 334,211 | 2,336,000 |
| March | 491,656 | 1,296,000 |
| April | 350,367 | 1,072,000 |
| Total | 1,384,766 | 6,917,000 |

## J. R. Parten Slated for PAW Assistant Deputy Post

WASHINGTON, D. C.—Maj J. R. Parten, director of the Transportation Division, Petroleum Administration for War, is slated for early promotion to assistant deputy administrator, as soon as his successor is appointed.

As assistant deputy administrator, Mr. Parten's assignment would cover coordination of transportation, marketing and supply. Currently, there are three assistant deputy administrators: E. DeGolyer, chiefly concerned with reserves; Robert E. Allen, administration and production, and Bruce K. Brown, refining.

## Proposed Oil Pipe Line In France Under Study

The Rhone-Rhine oil pipe-line scheme is in the hands of a study group, reports the British press. Compagnie Francaise des Petroles, which is prominently concerned in the work, has announced that the group will soon form a limited company, initially capitalized at 5,000,000 francs.

The steel shortage in France, it is felt, will hinder any early beginning of construction work, but a possible pipe-line connection between the mouth of the Rhone is of obvious importance.

## Swedish Shale-Oil Plant Yielding 210,000 Bbl. Yearly

The shale-oil plant at Kinne-Kleva (Kinnekulle) in the Province of Vastergotland, Sweden, owned and controlled by the Swedish naval authorities, has been in operation more than 1½ years, and now produces about 30,000 metric tons (210,000 bbl.) of fuel oil a year, chiefly for the Swedish Navy.

Recently a new test plant at Kinne-Kleva has started the production of light benzine, utilizing gas which, together with shale oil, is obtained from the shale distillation process. A new plant has also been built at Kinne-Kleva for experimental work.

FOUNDED IN 1910

BY PATRICK C. BOYLE

the OIL AND GAS JOURNAL

# Governmental Previews

THE petroleum industry in many ways is getting previews of what permanent government controls would mean in its operations in the postwar period. The latest examples apply to the production of crude oil on government lands.

A United States Senator last week succeeded in getting nationwide publicity by casting suspicions on an agreement between a private oil company and the Navy covering the development of Naval Petroleum Reserve No. 1 in California. Without any apparent understanding of the terms of the agreement and minus any knowledge of the long discussions that preceded its adoption, the Senator has at least delayed the execution of the operating program important in the war effort and vital in the future oil supplies of the West Coast states.

That this contract was entered into under the authority of a legislative act and was approved by the President in accordance with that law, makes no difference to this critic and his supporters.

They were not interested in reports showing how the exploration activities of the oil industry established this reserve and how the company concerned, at heavy expense to itself, through the years had cooperated in every way possible with the Government so as to assure the development of the area in the best interests of the Navy. No one familiar with oil operations will assert that the nation is not fully protected in the terms of the agreement which are essentially pro-government.

But these years of exploration, test drilling, careful development, and extended negotiations in arriving at fair terms go out the window in the interest of political expediency, never more disastrous than when it becomes entangled in oil operations.

Alongside this latest fiasco of politics in business can be placed the recently proposed oil-and-gas unit plan of the Department of Interior covering the exploration and exploitation of public lands including a proposed form of unit agreement.

Operators through their associations are right in their condemnation of the proposed regulations. In this instance the Government is the royalty owner and yet under the suggested plan it would control the operations of the working interests.

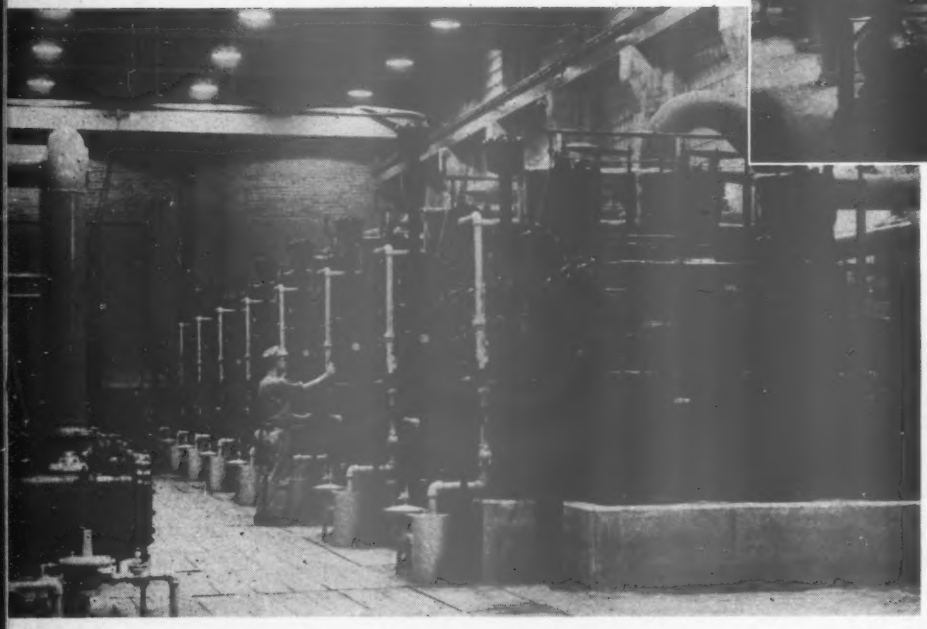
Following the usual government procedure of adopting one pattern, a standard form of agreement for all unit operations is urged. As one association has pointed out: "A unit agreement, as its very title implies, is a contract between owners in interest entered into by parties who have mutually agreed on its terms. A mandatory form of unit agreement, presented to the industry on a 'take-it-or-leave-it' basis, certainly belies its title."

It is fundamental in all unit agreements that every operation will differ from others and that the cloth of each application must be cut to fit the need. It is equally basic that control must rest with those having the operating responsibility. Operators should remain firm in their insistence that these regulations not be adopted.

In recent years government investigators have often been critical of the practices of private business. The truth is that except where political advantage is involved there is no one who drives a harder bargain than a governmental unit. If all operations were conducted on the same basis as its governmental transactions, there wouldn't be any oil business. Ending this situation should be one of the first objectives of the postwar period.

# STYRENE from PROPANE

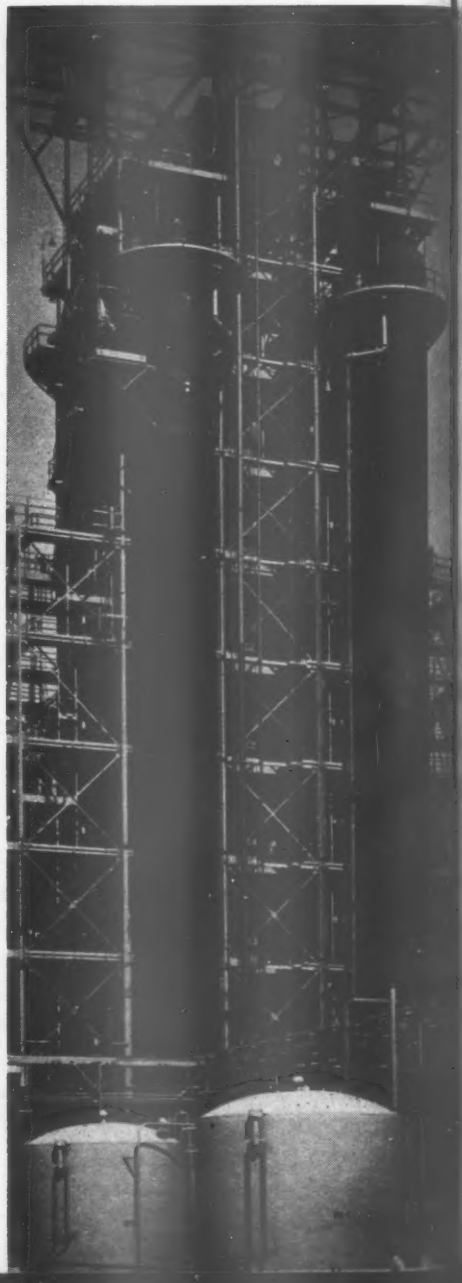
*Above: Starting point of process for alkylation of ethyl benzene*

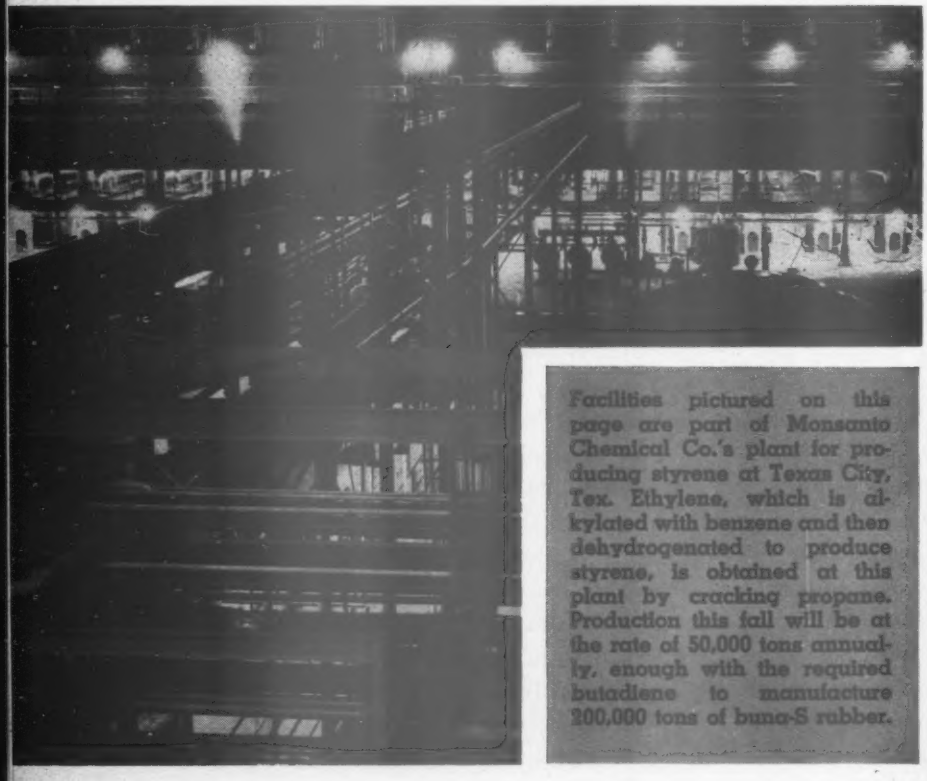


*Above: This water pumping station handles 35,000 g.p.m., enough for a city of 500,000*

*Below: Maze of pipes from processing lines. Dehydrogenation plant in background*

*Below: This distillation tower, a major factor in styrene production is 20 stories tall*





Facilities pictured on this page are part of Monsanto Chemical Co.'s plant for producing styrene at Texas City, Tex. Ethylene, which is alkylated with benzene and then dehydrogenated to produce styrene, is obtained at this plant by cracking propane. Production this fall will be at the rate of 50,000 tons annually, enough with the required butadiene to manufacture 200,000 tons of buna-S rubber.

# Texas City Styrene Plant Is Nearing Capacity Output

TEXAS CITY, Tex.—Styrene in sufficient quantity to supply a substantial part of the requirements of the six manufacturing units thus far making buna-S rubber is moving currently from Monsanto Chemical Co.'s plant here. Since March 10, when the first tank car of styrene was loaded at the Texas City plant, production schedules have been rising steadily as additional units were completed. Maximum production will be attained this fall when output at the rate of 50,000 tons annually is projected.

Pictures on the facing page, showing some of the basic units at the Texas City plant, attest to the enormity of the project. These additional data recently were disclosed by the operating company:

Steel and iron required for the plant, 13,250 tons; copper and alloys, 290 tons; alloy steel, 260 tons; nickel alloys, 16 tons.

Twenty per cent of the plant is underground.

### Protective Lighting

The plant is so lighted at night that the crew of an airplane passing overhead cannot see the lights. The plant can be blacked out completely in less than 60 seconds and still remain in complete operation.

Production capacity of Texas City plant even before working drawings were started was set at 3,000 tons per year. In rapid succession the design was changed to increase capacity to 6,400 tons, then to 10,000 tons and in January 1942 revised upward to 20,000 tons; in April to 40,000 tons and in September 1942 to 50,000 tons.

Manufacture of styrene at the Texas City plant is based on two raw materials: propane, a petroleum fraction, and benzene, a byproduct of coke ovens in this particular case, but a component that also could be produced from petroleum hydrocarbons. In the first step, propane is cracked to produce ethylene gas. This cracking operation is similar to methods used in the petroleum refining industry and requires approximately identical equipment. Ethylene gas and benzene are then combined by alkylation to produce ethyl benzene.

Styrene differs from ethyl benzene by having two less atoms of hydrogen and this conversion is accomplished by dehydrogenation.

Among the key men responsible for construction of the plant from the stage of pile driving to first production in 358 days are: Josiah B. Rutter, director of Monsanto's general engineering department; F. B. Langreck, chief chemical engineer; E. H. Buford, chief design engineer; C. J. Colley, chief power engineer; Ralph W. Booker, chief construction engineer, and Roy W. Sudhoff, assistant director of the central research laboratories.

The plant site covers 13½ acres that had to be filled in with sand pumped in from the bed of Galveston Bay.

Propane for the plant is obtained from a variety of sources. Some is purchased from natural-gasoline manufacturers and other comes from refineries in the general vicinity of the styrene plant.

The Texas division, set up February 5, 1942, to handle both the Texas City project and another government plant at Karnack, Tex., to be operated for the Army Ordnance Department, is headed by Osborne Bezanson, general manager.

# Bills of Materials Simplified Under Controlled Materials Plan

WASHINGTON, D. C.—Instructions for preparing bills of materials under the Controlled Materials Plan have been simplified, the War Production Board announced last week.

In issuing the instruction booklet, which supersedes General Instructions on Bills of Materials published November 14, 1942, Walter C. Skuce, director of the Controlled Materials Plan Division, said: "These instructions have been revised by the War Production Board, Controlled Materials Plan Division, in cooperation with the various claimant agencies, including the Army and the Navy, and with representatives of industry.

"No new forms are required by the revised instructions for bills of materials, and with the exception of a provision with respect to complete bills of materials, there has been no major change—the principal purpose of the revision being to clarify the instructions and make them simpler for industry to use in preparing proper bills.

### Accuracy Gages Speed

"The accuracy with which bills of materials are filled out determines the accuracy with which WPB may allot materials to war-production programs. As a consequence, industry cannot be urged too strongly to provide complete and accurate bills of materials whenever requested to do so."

The new instructions authorize claimant agencies to obtain complete bills of materials on major repetitive products such as airplanes, tanks and guns. It is pointed out that if a producer is asked to submit a complete bills of materials, he must show the requirements for the manufacture of Class B components as well as for the manufacture of Class A components. This constitutes a major change from past practice under which material requirements for Class B components could not be required in bills of materials.

The booklet defines a bills of materials as "a statement of the materials required to produce a given product, assembly, subassembly, or part." The distinction is retained between a detail bill of materials showing all materials required for each individual part or product, and a summary bill of materials indicating total quantities of each CMP material required for fabrication of the product, and in addition the time the various materials are required (lead time) in order for a manufacturer to meet his production schedule. Complete instructions for filing both detail bills of materials and summary bills are included in the new booklet.

The booklet spells out in detail the method of estimating "lead time" which must be entered on Form CMP-1, summary bill of materials, and for Class B products and items of government-furnished equipment on Form CMP-3. It is pointed out that no "lead time" on materials need be entered on Form CMP-2, covering the detail bill of materials.

# How P-98-b Procedure Works

WASHINGTON, D. C. — Tabulated explanation of the procedure in applying Preference Rating Order P-98-b to the industry's material requirements has been prepared by the Petroleum Administration for War.

The general procedure to be followed by operators in procuring any type of material or equipment for either new installations or for maintenance, repair and operating supplies is outlined in the accompanying table. The letters in the table are keyed to explanatory notes.

**PROCEDURE FOR PROCURING MATERIALS UNDER ORDER P-98-b**

| | Total less than $100 | Total over $100 but less than $1,000, no single item over $500 | Total over $1,000 or single items over $500 |
|---|---|---|---|
| **I. CAPITAL EQUIPMENT** | | | |
| 1. Controlled material | A* | A* | A |
| 2. Other | B* | C* | D |
| **II. M.R.O. (maintenance, repair, and operating supplies)** | | | |
| 1. Rock bits | E | F | F |
| 2. Cast iron valves over 12" | E | G | G |
| 3. Steel valves | E | G | G |
| 4. Regulators, control valves, relief valves and other industrial control instruments | E | G | G |
| 5. Emergencies involving actual breakdown or suspension of operation | H | H | H |
| 6. Other than above, including controlled material | E | F | G |

*Any production operation (excluding installation of pumping or artificial lifting equipment and plugging back or deepening of wells) not exceeding in total material cost $500 for any one complete operation which has not been subdivided for the purpose of coming within the maintenance and repair definition may be classed as M.R.O.

**PROCEDURE**

**A**—File Form PD-873 with district PAW office and affix allotment number obtained thereby to delivery order sent to supplier.

**B**—Operator affixes allotment number and preference rating assigned by his PD-873 form (AA-2X for second and third quarters 1943) upon his signed certified delivery order. No approval or submission of such delivery order is required.

**C**—Operator affixes allotment number and preference rating assigned by his PD-873 form (AA-2X for second and third quarters 1943) upon his signed, certified delivery order and sends **one copy** of delivery order to district office. No countersignature or approval is required.

**D**—Operator affixes allotment number and preference rating assigned by his PD-873 form (AA-2X for second and third quarters 1943) upon his signed, certified delivery order and sends two copies to district office for countersignature. One copy is returned to operator for his file. Operator may not place such delivery order with supplier until countersignature is obtained.

**E**—Operator affixes allotment symbol MRO P-98-b and AA-1 preference rating upon his signed certified delivery order. No approval or submission of such delivery orders is required.

**F**—Operator affixes allotment symbol MRO P-98-b and AA-1 preference rating upon his signed certified delivery order and sends **one copy** of delivery order to district office. No countersignature or approval is required.

**G**—Operator sends **two copies** of signed certified delivery order to district office for countersignature where it is assigned allotment symbol MRO P-98-b and AA-1 preference rating and one copy is returned to operator for his file. Operator may not place such delivery order with supplier until countersignature is obtained.

**H**—For emergencies involving actual breakdown or suspension of operations where other procedures will not allow the operator to obtain M.R.O. material on the date and in the quantity required, the operator may request authority to obtain delivery of such material by communicating by letter, telegram, or telephone with the PAW, Washington, D. C., Ref: P-98-b, supplying the following information:

(i) Date of actual breakdown or suspension of operations and exact explanation as to what extent operations are affected;

(ii) Description of equipment to be repaired and its function in maintaining continuous operation;

(iii) Price, quantity, and detailed description of necessary material (including weight if a controlled material) and number and date of delivery order(s) therefor.

Whenever any of the above information is furnished by telephone, the operator shall confirm such information within 3 days by a letter or telegram.

No delivery order for M.R.O. material for emergencies need be submitted.

# Standard and Navy Defend Contract

*(Continued from Page 34)*

ing of approximately 8,300 acres, for no consideration except surface value of $10 per acre.

2. Standard of California was designated to operate the reserve for the life of production.

3. Navy and Standard of California each are entitled to a percentage of the future production from the reserve, based upon acre feet of commercially productive oil sand underlying the lands being conveyed to the Navy and the acre feet of commercially productive oil sand underlying the remaining productive lands within the reserve (the Navy's share). The initial percentages are those agreed upon by the engineering representatives of Navy and the company, or approximately 64 per cent for the Navy and approximately 36 per cent for Standard. These percentages are applicable to the shallow oil zone, which is the only zone being produced. The deeper zone can be produced only with Navy's consent.

4. Navy and Standard of California each pay their percentages of the cost of development and operation. Standard advances all money necessary to cover Navy's share of costs and is reimbursed out of the Navy's share of production.

5. Navy has complete control over development and production with exception of the first 5 years during which an average daily production of 15,000 bbl. per day from the shallow zone prevails. Of this amount, approximately 36 per cent is Standard's share. Standard is permitted to take the balance of the oil, and after deducting Navy's share of the cost of production, is obligated to repay the same at the end of the 5-year period, out of one-third of Standard's future share of production from the shallow oil zone, or in refined products at the election of the Navy, if mutually acceptable. After the 5-year period, Navy may completely shut in production from all zones, except such small amount, not exceeding 750 bbl. per day, covering maintenance costs.

6. Standard has the right to purchase all of Navy's share of the oil, when it is produced, but has no right to say when any of the oil will be produced, except for the amount to be produced during the 5-year period. For all such oil Standard must pay the highest posted price for oil of similar grade and quality in Kern County, California, and if Navy thinks this price is not sufficient, it can secure bids and Standard must then pay the highest bid price.

7. Navy is to pay Standard approximately $1,750,000 to reimburse Standard for its excess share, over its percentage, of past development and operating costs, covering cost of wells and equipment. This payment is to equalize these costs, and is not the actual consideration for the agreement.

Permission for Standard of California to produce more than its share of the oil from the shallow oil zone for the first 5 years is in exchange for the company's relinquishment of control over its lands without compensation.

# Opposition to Kilgore Bills Increasing As Scientists Organize Against Regimentation

*by Arch L. Foster*

CONCERTED opposition to the two bills introduced in the Senate by Sen. H. M. Kilgore of West Virginia for the regimentation of all American science, technology and of scientific personnel is increasing rapidly all over the country. The latest clash over these bills occurred in New York at the recent annual banquet of the American Institute of Chemical Engineers, before which Senator Kilgore discussed his bills, their purpose and provisions.

Replying to Senator Kilgore, H. C. Parmelee, editor of Engineering and Mining Journal and formerly secretary and director of A. I. Ch. E., castigated the bill (S. 702) as "fantastic, naive, and terrifying," Dr. Parmelee pointed out that the tremendous powers granted a small group by this bill are "terrifying"; that requirement of an annual report of progress in all technology is so herculean a task as to be fantastic, one that requires "unattainable omniscience" on the part of the director of such an organization as these bills—607 and 702—propose to establish. "It" (the bill 702), Dr. Parmelee stated, "is so difficult to interpret that it is potent for evil."

### Absolute Control Provided

The absolute and totalitarian control of all American scientific education, research, development, industry and personnel provided for in these bills, "for the effective prosecution of the war and for peacetime progress and prosperity" as stated openly in Section 1 of S. 702, exhibits ramifications and possibilities for dictatorial absolutism that will be obvious to the technical or layman reader at first glance. Even as an agency for furthering the war program as such, those with the interests of the American people and the American way at heart may seriously object, say qualified persons acquainted with the situation. As another agent for the complete throttling of private enterprise and scientific progress it appears to be the equal of any of those developed by totalitarian Europe's various isms.

Ostensibly these bills are for the purpose of furthering the war program to eliminate the lost and waste motion of systematizing efforts to organize America's production of war material. The industry technologists are in full accord with this objective as indicated in their cooperative accomplishments since the war started. But they do object to the insidious method of inserting provisions in these bills which do not contribute to the war effort and reflect the type of thinking which brought the bills into being.

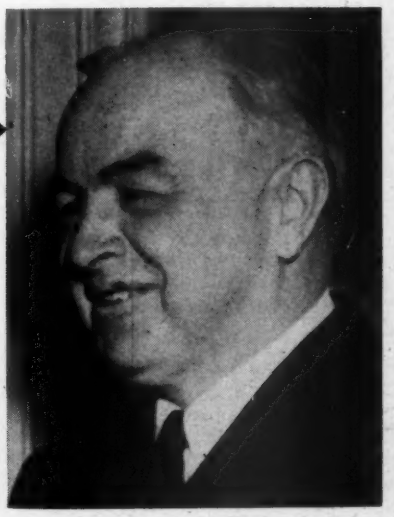
To mention briefly some of the many provisions of these bills; S. 702 provides in its first section, as quoted above, for a permanent war and peace organization. All scientific development, research and personnel are to be placed under one head, by this self-styled "Science Mobilization Act"—which has been termed elsewhere more appropriately "Science Communization Act"—and the work of all industry and scientific development is to be controlled and directed by this one head (Sec. 1, Par. 12). This tremendous task is to be under the exclusive control of an administrator to be paid $12,000 per year. He is appointed by the president with the advice and consent of the Senate **to serve at the pleasure of the president.** Such provision gives the president absolute power over every phase of American science and the industry built thereon.

This administrator, who most easily can be a presidential puppet not controllable by the law-making part of the Government, selects all his aids and subordinates under civil-service regulations; when he deems it necessary "he may waive these requirements," (Sec. 3a). He decides what pay these aids and employes are to receive. A National Scientific and Technical Board would be appointed by the president which shall perform such duties as the administrator shall decide. Nothing more absolute in authority and power has been proposed or carried out in any dictatorship.

Reasons for establishing this office are given as "the unassembled and uncoordinated state of information" on scientific matters; the "unplanned, and improvident training, development and use of scientific and technical personnel"; the "trend toward monopolized control of scientific and technical data and other resources," and "the absence of an effective federal organization to promote and coordinate, in the national interest, scientific and technical developments." These claims are made in the face of facts such as those that the United States has for example, the most voluminous and complete scientific and technical literature in the

*(Continued on Page 114)*

*THURMAN ARNOLD*



*SEN. H. M. KILGORE*

# Gasoline-Ration System Revised For Commercial-Vehicle Operators

WASHINGTON, D. C.—Changes in the design of the gasoline-ration coupons for commercial vehicle use beginning July 1 were under way by the Office of Price Administration as a further means of taking up "slack" mileage and of removing potential sources of black-market gasoline.

At the same time, OPA explained how it will join with the Office of Defense Transportation in enforcing the reduction in commercial vehicle use of gasoline to carry out earlier ODT announcements requiring reduction by 40 per cent.

A new TT coupon, which replaces the present T coupon, will be made valid for use throughout the country on July 1. The old type of T coupon, now being used by commercial operators, will be invalid on and after July 1, except in the northeastern shortage area where the ban on nonessential driving is now in effect. In that area, operators must keep on using the old type of T coupons which they now have in their hands, through July 25.

### Eastern Operators Cut

This "stretching" of the use of present coupons results in about a 40 per cent reduction in the amount of gasoline the northeastern operator may use, for the period from May 23, when the cut was first announced, by ODT, through July 25. This same reduction will be continued in the restricted area when the new TT coupons are issued in July.

In the northeastern area between July 1 and July 25, both the present T coupons and the new TT coupons will be valid. This is necessary to permit operators in other parts of the country, who will have only the new type of coupons, to continue to make through trips into the East in the course of their normal operations.

It will be illegal, OPA stated, for anyone to continue to hold, after July 5, any of the old type of T coupons, unless the coupons were issued by a local War Price and Rationing Board in the northeastern restricted area for operations in that area. Any such coupons which were issued for use in the South or West, and which are left over on July 1, must be surrendered to an ODT district office or a local War Price and Rationing Board not later than July 5.

### New Coupons Issued

Local boards began issuing the new type of coupons outside the Northeast restricted area June 15. These coupons will generally not be issued in the Northeast until after the second week in July, unless the operator can show that part of his driving is outside the restricted area, requiring him to have the new type of coupons immediately.

Local boards in the restricted area will not have authority in any case to issue rations for use above 44 per cent of the amount which would normally be issued for the third quarter, unless ODT has issued a Certificate of War Necessity authorizing additional rations. Because of the ever-critical eastern shortage, relief from the cut may be obtained in only a narrow class of cases and in every case the appeal must be made to the district offices of ODT or, in the case of farmers, to county farm transportation committees. Those offices will notify the local boards directly of the additional amounts, if any, to be allowed.

# DEATHS

**G. R. Hagens,** 63, Casper, Wyo., attorney who was associated with a number of oil companies in a legal capacity, last week died in Denver, Colo.

**Orus Adeial Bingman,** pioneer producer and drilling contractor of Okmulgee, Okla., died last week at a Tulsa hospital. Funeral services were held June 18 at Okmulgee.

**Harry L. Edwards,** 54, president of the Harry L. Edwards Drilling Co., died June 10 at his hotel apartment in Houston, Tex. He was one of the most active independent contractors and operators in the Gulf Coast region.

**Robert Graves (Monty) Bouldin,** 71, retired production foreman for the Gulf Oil Corp. in the Goose Creek, Tex., district, died last week at a Goose Creek hospital after a brief illness.

**William T. Spencer,** 75, who 30 years ago built derricks in the Goose Creek, Texas, oil field from timber cut by hand in nearby woods, died recently in his home near Goose Creek. His family lived in the oil field until a blazing well ignited their home and forced them to leave. Mr. Spencer's mother, Mrs. William Spenver, 95, resides in Savannah, Tenn.

**Homer Elliott,** 29, of Graham, Tex., was killed last week when he fell from a 122-ft. derrick on which he was doing dismantling work northwest of Murray, Throckmorton County, Texas.

**Russell M. Obert,** 41, appraisal engineer for the Ohio Fuel Gas Co., Columbus, Ohio, died June 5 of a heart attack. He had been employed by Ohio Fuel Gas for the last 14 years.

**Harley B. Neal,** 43, owner and founder of the Harley Sales Co., oilfield equipment distributors and formerly employed by Gulf Oil Corp. and Waite Phillips, died June 14 at a Tulsa hospital from a heart attack. Survivors include the widow, a son, his parents and a brother, Roy Neal, a producer and natural-gasoline manufacturer.

**W. A. Chase,** 74, pioneer Mid-Continent producer, credited with being one of the discoverers of the Nowata field, and a lawyer, died at a Tulsa hospital June 13.

## Mid-Continent Cleared Of Labor-Law Violation

WASHINGTON, D. C.—All charges of unfair labor practices against Mid-Continent Petroleum Corp., and its subsidiary, Cosden Pipe Line Co., were dismissed here last week in a decision by the National Labor Relations Board.

The NLRB decision held "that the manner in which the union conducted the strike places it in that category of strikes declared by the United States Supreme Court to be unlawful."

The strike upon which the 5-year labor dispute hinged was called December 22, 1938. The Oil Workers International Union asserted that the company supervisory personnel made disparaging remarks about the union; advised union members they would be discharged if they went on strike; hired an unusually large number of armed guards in an attempt to intimidate the union; forced union members to remain on duty in the refinery during the strike; threatened union members with discharge if they did not abandon the strike and discharged 245 employes because they joined the union.

The board ruled that the guards were justified for the "legitimate purpose of protecting the company's property in the event of a strike" and that the company was completely within its right in the discharges, which the company said were because of overt acts.

# Determination of Productive Capacities Of Flow Pipes on Gas Lift

*by S. F. Shaw**

**This article, by one of the outstanding authorities on gas lift, is a progress report based on experimental work done at the A. & M. College of Texas. It discussed the capacities and efficiency of different diameters of flow pipe.**

THE particular phase of gas lift discussed in this article is largely that of determining the capacities of various sizes of flow pipes. This is a project of the Engineering Experiment Station of the A. & M. College of Texas, and tests are being made in the petroleum engineering laboratory to ascertain the underlying principles that have an influence on these capacities. The results of the tests that have been carried out to this time are being discussed in this article, and when the work is carried as far as the facilities of the college will permit it is expected that the results will be published by the college in bulletin form.

So far, this work has covered the determination of the capacities of 1½-in. pipes of about 10½ ft. in length, operating under submergences ranging from 25 to 74 per cent. Eight series of tests have been made with each of these pipes, making a total of nearly 600 complete individual tests or nearly 4,000 supporting test observations.

### Field Laboratory

It is planned to set up in the field laboratory, 60 ft. each of 1, 1½, 2, 2½, and perhaps 3-in. pipe, and run tests with these longer strings in much the same manner as those made in the laboratory, though probably not attempting to make as many series of tests for a given length of pipe as in tests made in the laboratory where it was desired to make a close study of results. After these flow pipes have been tested in the derrick, it is planned to make tests with different sizes of pipe in wells 450 and 750 ft. in depth on the college grounds and carry these tests as far as the facilities of the college will permit. Eventually it is hoped that this work may lead to a deep well becoming available where adequate facilities may be afforded for carrying out such tests in such a well with much larger diameters of pipe.

It might appear that testing gas-lift flow of liquid in very short pipes is of no particular value to the oil operator, for he would never attempt to lift oil or water under such a condition, but it appears that certain characteristics which are revealed when testing short pipes permit analogous interpretations when making gas-lift tests in very long strings of pipe and permit curves to be drawn that cover the range of significant points between short and long strings of pipe. Tests on very long strings can be made only in a well or in a deep shaft, therefore, the study of preliminary results can be made to better advantage with short lengths of pipe where everything is under complete control of the investigator, and these studies can be used to advantage in anticipating the results to be expected in long pipe columns. Many tests already have been made by the writer with long strings of pipe ranging from 3,000 ft. to 9,000 ft. in length.

The tests being now made cover only the lifting of water, since water is the standard of density for liquids. Before this work can be considered as completed it will be necessary to make comparison of the lifting characteristics of salt water of different densities, also those of oils of various densities and viscosities, in order to determine the relative effects of these properties on the lifting characteristics of various liquids.

### Two Principal Questions

The two principal questions that are to be answered and that are of practical value to the oil operator are these:

1. What is the capacity on gas lift of a pipe of a given diameter and length, when lifting a liquid of a given character, under a given submergence or flowing pressure, at a given significant rate?

2. How much gas is required to lift a barrel of liquid of a given character, through a pipe of a given diameter and length, under a given flowing pressure, at a given significant rate?

If we had the answers to these two questions in tabulated form or in graph form for all of the conditions that might arise, we could leave all of the theoretical considerations to the theoretical research investigator for solution.

### Terminology

In order that there may be an understanding of some of the terms that are being employed in this article on gas lift, a few of them will be defined, as indicated in Fig. 1, where there is shown the arrangement of pipes as employed in the petroleum engineering laboratory, also the usual arrangement of pipes in a natural flowing well.

The eductor, or flow pipe, or pro-

*Associate Professor of Petroleum Engineering, A. & M. College of Texas.

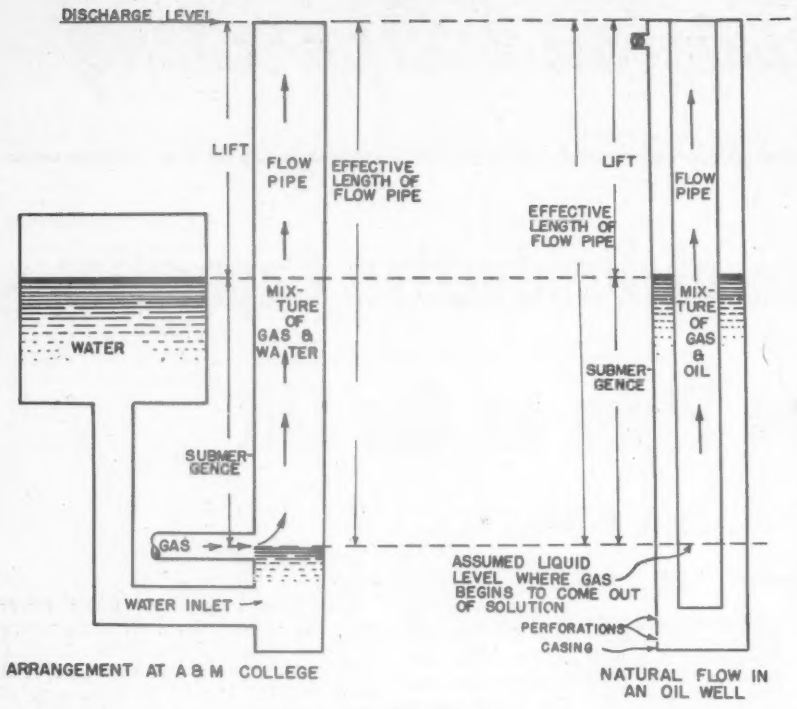



*Fig. 1—Gas-lift terminology*

duction string, is the pipe through which the flow of liquid takes place, whether through a pipe unobstructed in any way, or through the annular space between the casing and the tubing.

The static level is the level of the liquid when the well is not producing.

The working level is the level of the liquid when the well is producing at some given rate.

The drawdown is the distance from the static level to the working level.

The lift is the distance from the working level of the liquid to the level at which the liquid is discharged at the surface.

The submergence is the depth to which the flow pipe is immersed below the working level of the liquid.

The flowing pressure is the pressure of the gas at the entrance to the flow pipe. Pipe arrangements in an oil well may not leave a place for the liquid to seek a level when employing artificial gas lift, but there is always a pressure at the entrance of the gas to the flow pipe that corresponds with the liquid level. This pressure is called the flowing pressure, or submergence pressure.

The percentage of submergence is equal to the feet of submergence divided by the effective length of the flow pipe.

### Ideal Rates of Flow

In the tests being made at the A. & M. College, importance is attached primarily to the ideal or fundamental rates of flow, since such tests provide something definite by which graphs can be constructed of a character that can be interpolated and extrapolated to determine other such points.

In making gas-lift tests, it is necessary to establish certain fixed conditions after which capacities and efficiencies can be determined by making tests under these fixed conditions. For example, a set of tests is made in a flow pipe of a given diameter and length, with a given character of liquid, while maintaining the submergence at a given point, by adding gas in gradually increasing quantities, thereby determining the significant capacities of the flow pipe under these conditions. After this series of tests is completed, the submergence is changed to another level, and another similar set of tests is run, and this procedure is continued until all of the significant rates are determined for all of the submergences that are considered sufficiently important to investigate.

### Significant Rates of Flow

In carrying out tests with conditions fixed as stated, there are four significant, or standard, rates of flow:

1. Point of no flow at which the quantity of gas admitted to the flow pipe is just insufficient to start a flow of liquid. This point is of little practical value to the oil operator.

2. The rate of maximum lifting efficiency is that at which the quantity of gas per barrel is at a minimum. If a line be drawn from the origin of coordinates tangent to the fundamental production graph, the point of tangency indicates the rate of maximum lifting efficiency.

3. The rate of maximum capacity is that beyond which there can be no further increase in the quantity of liquid lifted. If the quantity of gas required to reach this rate is either increased or reduced, the quantity of liquid is reduced.

4. Another point of no flow is reached when the quantity of gas is in such excessive volume that in passing through the flow pipe it sets up a friction loss equal to, or greater than the submergence pressure, thus preventing any liquid from entering the flow pipe. This point is of no practical value to the oil operator.

In glass models set up in the laboratory, using glass tubes 1 in. in diameter and 3 ft. in length, all of these rates were passed through again and again to study the characteristics of the flow at these standard rates of flow.

It is important to determine closely

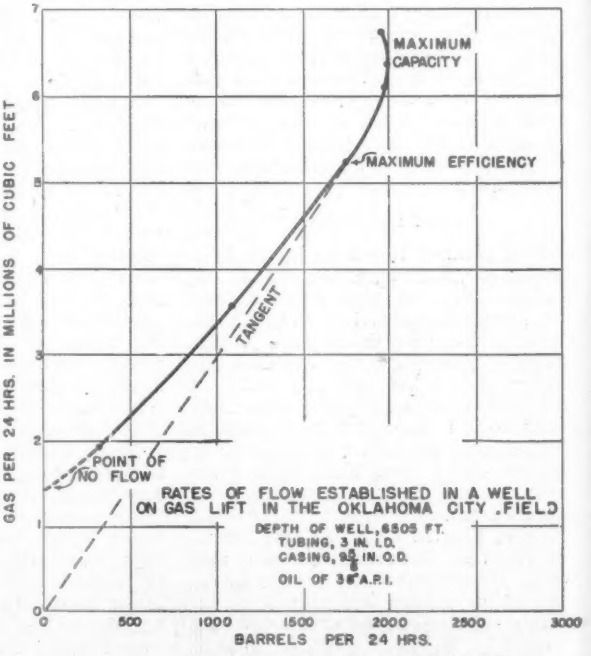
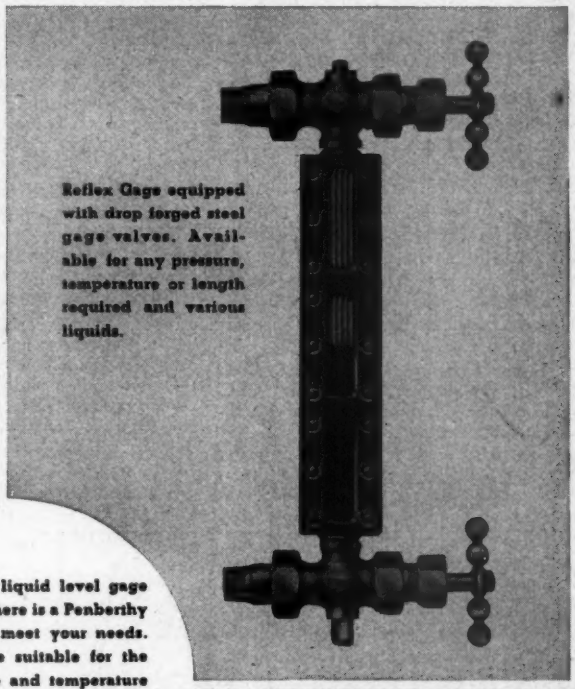



*Fig. 2*

# A PENBERTHY GAGE
## FOR EVERY PURPOSE

**All Penberthy Gages conform with A.S.M.E., Federal and State requirements when used for pressures specified by their respective codes.**

**Reflex Water Gage Set designed for oil field boilers.**
**Type A—Navy Bronze.**
**Type B—All Iron.**



**Reflex Gage equipped with drop forged steel gage valves. Available for any pressure, temperature or length required and various liquids.**

**Whatever your liquid level gage requirements, there is a Penberthy Gage that will meet your needs. These gages are suitable for the various pressure and temperature requirements of the oil industry. Write for a copy of new catalog.**

**Supply houses everywhere stock Penberthy liquid level gages.**

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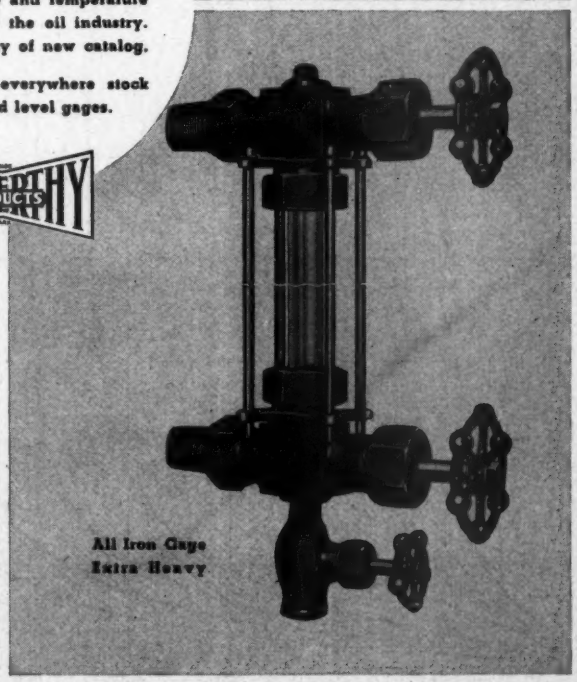
**Navy Type Gage**
**Extra Heavy Bronze**



**All Iron Gage**
**Extra Heavy**

# PENBERTHY INJECTOR COMPANY

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the rates of maximum lifting efficiency and maximum capacity, since these are the important rates for practical use. All intermediate rates are of no practical value except as they aid in locating the significant points, and a sufficient number of intermediate points must be observed in order to establish the location of these principal rates of flow.

The rate of maximum capacity can be definitely and satisfactorily determined even without measurements of the gas except as it is an aid to denote the approach to the maximum rate. The rate of maximum efficiency is indicated fairly closely in the graphs in Fig. 3, but since the loci of these points sometimes may not seem to fall along a smooth curve, it becomes necessary to obtain not only very close accuracy in determining the rate of flow of liquid, but also that of the gas flow, which, in very small volumes, is much more difficult of determination than that of liquid flow. The loci of points of maximum capacity determined in these tests when plotted against flowing pressures result in very smooth and satisfactory curves.

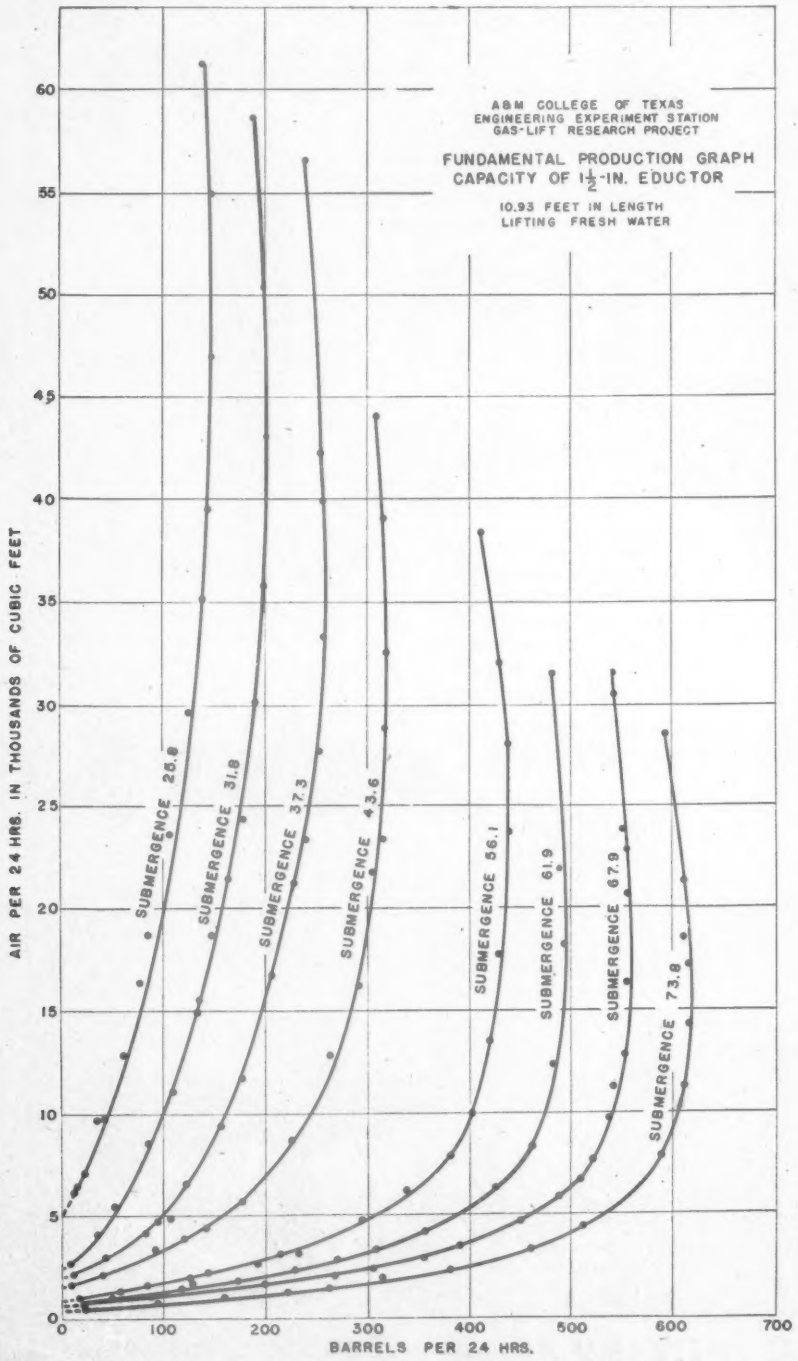



*Fig. 3*

### Ideal Conditions of Submergence

The ideal conditions, of course, include that in which the submergence remains fixed, that is, it does not change during a series of tests. This condition can be established and maintained in a laboratory, or in a well in which the bottom of the casing is plugged and where the required quantity of water is poured down the well that will set up the desired fixed submergence. Rates of maximum capacity and maximum efficiency can then be determined, also the quantity of gas required to flow the well at these rates can be determined, but in an oil well, or in a water well, where production comes from a sand surrounding the well, it is not possible to have the same control as in the laboratory, and these significant rates cannot be determined as definitely as in the laboratory because of the drawdown that takes place when the quantity of gas is increased in order to increase the production of the well. However, a "pseudo" maximum efficiency rate can be determined in an oil well that serves the purpose fairly well, so far as production of oil is concerned. In oil wells, the drawdown condition causes the graph points to cut across the fundamental graphs, thus forming a sort of composite curve.

The graph in Fig. 2 illustrates the first three significant rates of flow as taken from a set of production tests made in a well in the Oklahoma City field, and might well be termed the fundamental production graph of a gas-lift test on an oil well. To reach the point of no flow due to excessive quantity of gas would have required between 12 and 15 million cubic feet of gas per day, which was not available at the time the test was made.

Fig. 3 shows the graphs of eight production curves of the type made in the laboratory in which close control was held to study the effects of changes in the quantity of liquid that was lifted. The tests were started by adding just sufficient gas to start the flow through the pipe, as closely as this could be controlled. In Fig. 3 it will be observed that in a pipe 10.9 ft. in length and 1½ in. in diameter, the quantity of gas required for the point of no flow, for submergence ranging from 26 to 74 per cent, varied from about 500 to 5,000 cu. ft. per day.

It may be observed that at the submergence of 26 per cent, the quantity of gas required to reach the point of maximum production was greater than for any of the higher submer-

page 51-52 advertising

gences, and this required quantity of gas diminished as the percentage of submergence was increased. The percentage of lifting efficiency increased until the submergence reached 68 per cent, after which the lifting efficiency began to decline, even though the submergence was further increased.

The quantity of gas required to lift 1 bbl. of water when operating at maximum efficiency also was greater with the minimum submergence used, and gradually increased in lifting efficiency until it reached 63 per cent with a submergence of 62 per cent beyond which submergence the efficiency abruptly began to decline.

These graphs are the fundamental graphs of production tests in which the submergence is maintained at a fixed percentage. Sufficient tests have not yet been made with different diameters and lengths of flow pipe to determine just what are the limiting points of efficiency for the rate of maximum efficiency and maximum capacity. However, regularity in the character of the graphs may be observed in Fig. 3. These graphs were carried beyond the rate of maximum capacity in order to insure that this point had been reached, although flowing rates beyond that of maximum capacity are of little value to the operator.

From the tests made with 1 and 1½-in. pipes, there have been constructed two graphs showing the maximum quantity of water that can be lifted through each of these pipes with a given flowing pressure, as shown in Fig. 4. It will be seen that the maximum capacity rate does not vary directly as the areas of the two pipes, but over the range covered, it corresponds to a rate nearly 50 per cent higher than the relative capacities of the pipes. It is important to have at hand such definite information on relative capacities when lifting oil or water from a deep well.

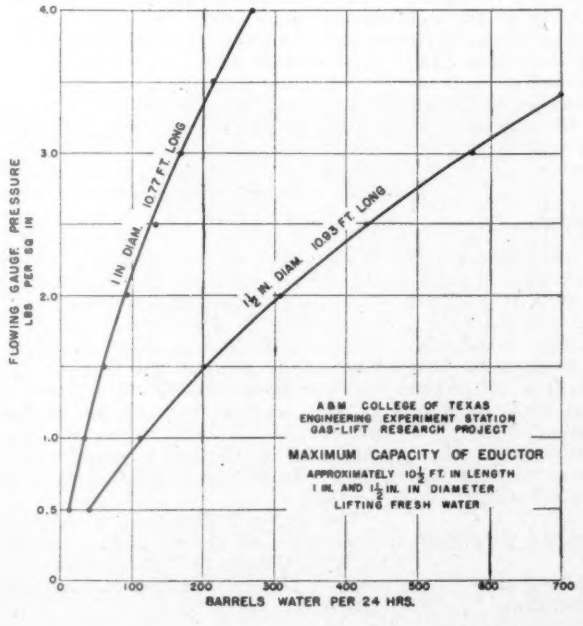
The operator can use to advantage graphs showing the maximum capacity and maximum efficiency rates for various lengths and diameters of pipe. With these he can determine the size of casing advisable to run when he has some idea of the quantity of salt water he may have to lift later in the life of the well in order to make the operation profitable. Such a tentative graph is shown in Fig. 5 for 3-in. pipe up to 10,000 ft. in length, when producing 38° oil. It may be observed that the capacity of this pipe declines to very small quantities as the flowing pressure declines and as the length of the pipe increases. These curves were constructed from graphs of Seminole and Oklahoma City tests and represent actual determinations at 4,100 and 6,500 ft. They were extrapolated beyond 6,500 ft. and below 4,100 ft. If the operator is of the opinion that his well should make more oil than it is making, he would need to have at hand similar graphs for other sizes of pipe as a guide to indicate whether he could substitute safely another size for the 3-in. pipe. Or, if the drawdown is such that no more liquid can be produced than when operating at a considerably higher submergence, he might be able to substitute a 2½-in. tubing to advantage.

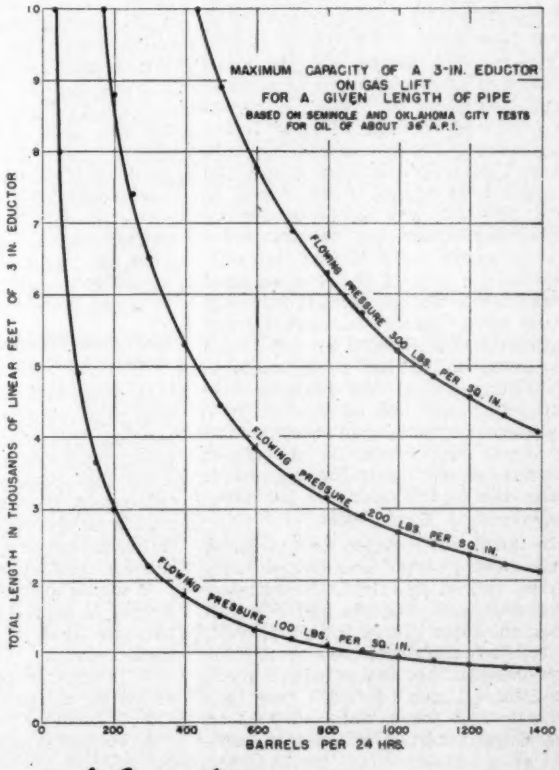
The engineer may wonder whether it is possible or practicable to construct graphs of this character. This may be answered by the graphs in Fig. 6, showing the maximum capacities of various sizes of pipe that were employed in the Seminole field, Oklahoma, when producing at various flowing pressures. For example, when producing through 3-in. tubing with flowing pressures of 300 lb./in.², the capacity is about 1,300 bbl. of oil per day, whereas the capacity of an 8⅝-in. casing with 4-in. tubing when producing through the annulus is nearly 8,000 bbl. per day. Or, with flowing pressure of 100 lb./in.² the capacity of the 3-in. tubing is about 130 bbl. per day, while that of the 8⅝-in. casing is about 1,200 bbl. per day. These graphs were constructed from about 10,000 tests made in the Seminole field, and served the purpose quite satisfactorily while producing on gas lift in that field.

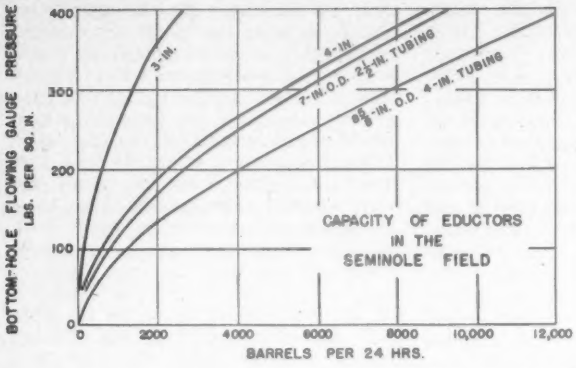
It is desirable to know not only what is the capacity of a flow pipe under different conditions, but also important to know how much gas is required to lift a barrel of oil under these conditions. Some 15,000 tests made in the Seminole and Oklahoma City fields provide the data for the graphs shown in Fig. 7, indicating the quantity of gas required to lift a barrel of oil under these different conditions. Since the cost of the gas has a large bearing on the outcome in such operations, especially when a well is nearing depletion, it is important to know how much gas is required to lift the oil in order to have some idea as to what the lifting costs will amount to.

*(Fig. 4 (below)*

*Fig. 5 (right)*





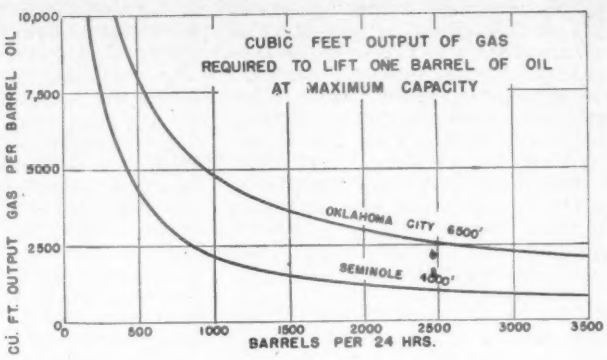




*Fig. 6 (left) and Fig. 7 (right)*

**Advantage of Gas Lift for Lifting Large Quantities in Deep Wells**

Wells are gradually reaching to greater depths, and in the course of time much of the oil produced will come from depths at which the usual production methods are unable to perform satisfactorily. Up to now we have found that the deepest wells have not failed to produce under natural flow, if sufficient gas was available in the reservoir. Except in a well flowing under artesian conditions, the only respect in which natural flow differs from artificial gas lift is that all of the gas required to perform the lifting operation is furnished from the formation with the oil; none comes from an extraneous source. When these wells cease to flow naturally it is because of a deficiency in gas, and when this takes place the deficiency can be made up by gas from some other source, such as a compressor plant or a gas well.

The gas lift can be used to much advantage when deep wells yield large quantities of water and must be produced at high rates of liquid even when restricted production is in force. The Gulf Coast has furnished many a field where, in the course of time, the oil was accompanied by such large quantities of salt water that in many wells it was unprofitable to use any of the conventional lifting methods. The gas lift probably would have operated successfully and profitably in some of these wells, had the same knowledge been available that we have at the present time concerning the use of this method. There can be mentioned comparatively recent occurrences in the Saxet Heights, Saxet and Refugio fields along the Gulf Coast and the Hendrick field in West Texas.

In the Saxet Heights field, at 4,100 ft. in depth, water encroached early in the life of the field. Casing sizes employed were 5½, 6⅝ and 7-in. Toward the later life of the field, wells with 7-in. casing produced up to 5,000 bbl. of liquid per day of which quantity the oil constituted 1 per cent or less, and these wells showed an operating profit. During this same period, wells that had been completed with 5½-in. casing would produce only 1,500 bbl. per day with less than 1 per cent oil, but were unprofitable and had to be abandoned, in fact, they had to be abandoned 1 to 2 years earlier than wells completed with 7-in. casing, and, therefore, ultimate recovery in these wells with 5½-in. casing was reduced by that condition.

In the Saxet field, about a year ago, wells on gas lift in the 5,800-ft. sand would produce up to 7,000 bbl. of liquid per day of which 2 per cent was oil and these wells showed a profit. At the same time wells producing under similar water conditions through 5½-in. casing would yield only 1,500 bbl. of liquid per day, and the percentage of oil was considerably lower than when producing through the 7-in. casing. This operation with 5½-in. casing was unprofitable and the wells had to be abandoned. This, of course, meant a loss in ultimate recovery.

Wells in the Hendrick field have produced on gas lift as much as 20,000 bbl. of liquid per day of which less than ½ per cent was oil, and yet this was done at a profit. Such wells would indicate a loss in ultimate recovery if they had to be abandoned because of inadequate lifting methods, but such wells must be produced at a high rate even on gas lift to make them profitable.

**Increased Percentage of Oil in Fluid Resulting From High Rates of Flow**

In many instances it has been found that producing at high rates of liquid resulted in a higher percentage of oil being produced than when operating at a low rate, and this meant the difference between profit and loss, and consequently in the difference between keeping the wells on production and abandoning them.

It seems quite possible that by producing at high liquid rates, wells will increase their ultimate recovery for these reasons:

1. It often increases the percentage of oil in the field.
2. It reduces the lifting costs.
3. It delays abandonment.

Conditions under which increased percentage of oil has been recovered because of producing at a high daily rate have been shown, of course, by other methods as well as by gas lift. In Oklahoma, Kansas and Illinois, remarkable increases in production have been made with the centrifugal pump. In instances where wells were abandoned, or about to be abandoned, they were equipped with centrifugal pumps and production was restored to a profitable rate. Certain wells in parts of the St. Louis pool, Oklahoma, had gone largely to water and were to be abandoned; some of these wells were placed on centrifugal pumps and made such large increases in oil that wells in nearby areas were newly drilled and produced by the same method at highly profitable rates. This definitely spells higher ultimate recovery. One well making 50 bbl. of oil and 300 bbl. of water, or 14 per cent oil, was placed on centrifugal pump and made 1,600 bbl. of liquid of which 800 bbl., or 50 per cent, was oil. In this instance, increasing the daily rate brought in large quantities of oil that did not enter the flowing streams under the higher back pressure in the formation that was unavoidable when operating at the much lower rate of withdrawal.

With such illustrations before us as those just mentioned, it seems important to develop lifting methods that will greatly increase the daily rate of fluid production, whether it be on gas lift or on any other method. Conditions may favor the use of gas lift in certain areas, and they may favor the centrifugal pump in other areas.

So little is known definitely about the capacities of different diameters of pipe at great depths that it would seem to be a propitious time to determine these capacities and thereby be in a position to make use of the method to the limit when the reserves of oil decline to a daily rate where the supply does not equal the demand.

The writer is indebted to the Engineering Experiment Station of the A. & M. College of Texas for permission to publish the material in this article.

## Ditch Facilitates Cleaning of Tanks

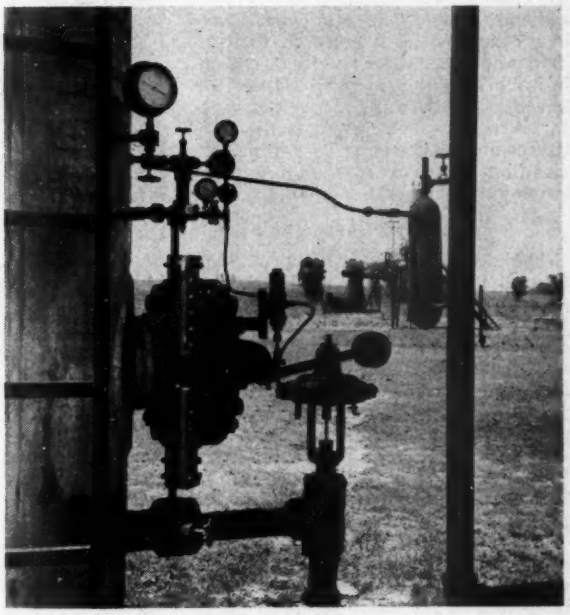
ONE operator in Kansas parallels each field tank battery installation with a plank-lined cleanout ditch which leads to a refuse pit removed from the battery. The open ditch has greatly facilitated cleaning of the tanks. Bottom drain lines of all tanks in the battery empty directly into the ditch. Cleanout plates also are located over the ditch. Flow in the ditch is by gravity, and viscous bottoms can be washed out easily. The ditch replaces cleanout lines which might become clogged.

# OPERATING IDEAS

## Hot-Water Heater for High-Pressure Gas

IN one pressure-maintenance project the high-pressure gas being returned to the input wells had a tendency to freeze the volume and pressure control regulators and connections where the gas to the individual wells was taken off the main gas return line and expanded. Various types of heaters were tried but the one that has proved most effective and suitable for the particular needs has been a home-made hot-water unit. It was made from a section of 20-in. pipe about 14 ft. long, ends of which were closed. This unit is installed

horizontally with the high-pressure gas line extending lengthwise through it. Inside, the 2-in. gas line is swaged to 4 in. to provide greater heating surface. The shell, covered on the outside with insulation to conserve heat, is kept filled with water, heated by means of a gas burner inserted in a 4-in. pipe extending lengthwise through the heater at the bottom. Fuel gas is bled off the high-pressure line through a pressure-reducing valve. Makeup water is hauled by truck to the various heaters in the field.



## Drier for Separator Regulator Control Gas

A SMALL individual drier for the gas used in operation of the pressure-controlled flow regulator valve is included in each high-pressure separator installation by the operator in one Kansas field. The drier unit, designed by the operator, consists of a small container for the drying agent (glycol in this case), through which the regular control gas is passed. The chamber is closed at the bottom, and also at the top except for the small gas inlet and outlet lines. It is mounted on the separator vent gas line and has a small line connection to it with a needle valve control to supply the necessary gas. The gas is directed through a nozzle to the bottom of the chamber, where it passes up through the drying agent to the ¼-in. outlet line at the top, and thence, with the moisture stripped, through two small pressure-control and reducing valves to the diaphragm of the flow control valve. By drying the gas the operator reduces the chances of freezing in the pressure and flow control valves and eliminates other difficulties common to moisture accumulation.

# Acid Deepening of Wells

*by Leo Courter**

THE deepening of wells to improve their production characteristics is a common practice. Usually it is done with a spudder or small rotary except in those cases where the well is to be drilled much deeper or where high pressures are to be expected. In such wells a standard rotary is commonly used.

In some fields it has been found necessary to deepen the wells only a few feet in order to secure material increases in production. Where this is the case various conventional drilling methods have been employed. However, the cost of moving in tools to drill and clean the wells out is prohibitive in many instances. Operators in some Oklahoma fields are overcoming some of their mechanical difficulties and are keeping deepening and cleaning out costs at a minimum by employing chemical methods.

### Jetting and Deepening

The deepening of wells producing from limestone by the application of acid is by no means a new idea. In fact, the jetting of formations to increase production and for the removal of scale deposits and cement sheaths has been carried on for a number of years. However, the adaptation of this practice to deepening operations using a standard rock bit, rotated by tubing or drill pipe has been found to be much more successful than the previous procedures.[1]

The possibilities of this adaptation are quite numerous but up to the present most of the wells have been deepened in limestone reservoir rocks or, in some instances, drilled through a portion of a sand zone into a lime section.

*Fig. 1—Swivel setup for acid deepening of wells*

The equipment used for deepening wells with chemicals has been simplified greatly, no expensive or specially built equipment being necessary. A standard pulling unit for raising and lowering the tubing during the drilling operation is, in most cases, the only equipment furnished by the well operator.

The swivel utilizes a standard steel hose and swivel joint. The tubing is supported by regular 2½-in. EUE elevators with a vertical thrust bearing centering the tubing string in the elevators. This is illustrated in Fig. 1. The rotary table is mounted on a regular casing head or casing, so constructed that circulation or pressure encountered in drill can be packed off. The table as shown in Fig. 2 can be handled easily by two men.

The power required to operate the rotary table is supplied through V-belts from a pulley attached to the rear wheel of ¾-ton pickup truck powered by a 60-hp. motor. The table may be driven also by a shaft attached to a power takeoff on the truck. The belt-driven unit is shown in Fig. 2. The speed of the rotary table will vary with drilling conditions, the usual range being between 75 and 150 r.p.m. The pickup serves, also, as a means of transporting the rotary table, swivel and other drilling equipment to the well site.

### Type of Bit Used

A standard rock bit has been adopted to this type of work by inserting 7/64-in. jet in the regular water course. This jet directs a stream of inhibited acid downward, ahead of the bit. This high-velocity stream dissolves and disintegrates the rock, leaving very little for the bit to remove. Just above the jet is an arrangement of ports that may be opened if the jet becomes clogged, thus eliminating the necessity of pulling the tubing while filled with acid.

The pressures used in the acid drilling operation will vary with the composition and acid solubility of the section being penetrated. However, the optimum drilling rate on most wells deepened to date is secured when the average pressure differential across the jet is of the order of 1,000 lb. per sq. in. Field experience, to date, indicates that where the pressure differential is maintained at about 1,000 lb. per sq. in. across the jet and acid injected at about 15 to 18 g.p.m., a 4¾-in. hole can be drilled in nonporous limestone at the rate of 8 to 10 ft. per hour. A 5¾-in. hole can be drilled in the same type of limestone formation at the rate of 6 to 8 ft. per hour. A hard, cherty limestone has been drilled at the rate of 3 ft. per hour accompanied by some wearing of the bit.

*Fig. 2—Rotary table used in acid deepening of wells showing belt drive operated from rear wheel of pickup truck*

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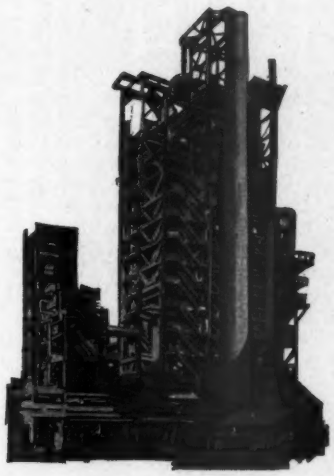

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The amount of acid consumed in acid drilling is a function of the injection rate and the solubility of the formation drilled, the usual deepening operation in a limestone will require about 115 gal. per foot of hole drilled. In most of the wells that have been deepened by this method to date circulation of the acid has not been maintained, because of the low reservoir pressure. In wells where acid circulation is maintained, the acid passes through a settling tank so that the insoluble cuttings are removed before the acid reached the pumps, thus avoiding undue abrasion of the valves and the jet in the rock bit.

When an acid deepening operation is to be made the equipment is assembled around the well in such a manner as to present most convenient operation. The pulling machine which controls the position of the drill stem or tubing is shown to the rear of the pickup truck, which furnishes the power to operate the rotary table. The inhibited acid, which serves as a drilling and circulating medium, is pumped into the tubing or drill stem through a pipe connected to the swivel as shown in the illustration. The acid pump and transport truck is at the left.

### Drilling Time

The degree of porosity of the formation is indicated by drilling time, some zones being penetrated at the rate of 30 ft. per hour. Drilling time is usually observed carefully as it is about the only way to secure information on the nature of the section being drilled, the cuttings being dissolved by the action of the acid upon them.

The main advantages of acid deepening of wells lie in its economy, costing about 25 per cent less than the standard drilling methods. Other advantages are: (1) Minimum amount of equipment required by operator. (2) Bailing of the well and mud conditioning are not prerequisites to the acid drilling method. (3) Shutdown time is held to a minimum, usually not over 2 days being required to deepen a well. (4) No cleanout is necessary after deepening. (5) A small well crew, consisting of one tubing unit operator and helper, is all that is needed. A regular tubing crew will be needed to make the two round trips of the tubing at the start and finish of the operation. (6) The acid serves a dual purpose: it does most of the drilling and increases the permeability of pay zones. (7) As most of this type of work is done in limestones, bailing to remove cuttings is not necessary.

The economic limits of the process are not definitely known as the maximum of section drilled in any one well has been 62 ft. In this instance the results obtained were entirely successful and profitable. It is believed, however, that the greatest benefits of the process will be obtained where the amount of section to be drilled is not exceedingly great.

### Acknowledgment

The author expresses appreciation to the Carter Oil Co. for furnishing wells on which much of the experimental work on acid drilling was done and to Harold Spiller, Carter Oil Co., Seminole, for his help in compiling some of the information included in this paper.

# Questions on Operation

**From a recent article in The Oil and Gas Journal ("Gas From Upper Sand Used While Drilling Well," Mar. 3, 1943, p. 42), we get the impression that water is being stripped from gas used for engine fuel by passing it through a chamber containing oil. Will you explain this action?—H. C. C., Grand Rapids, Mich.**

The purpose of the oil chamber in the installation described was to trap out the entrained water picked up when the sour gas was passed through the chamber filled with caustic soda. It is not intended to scrub the gas of its natural liquid content as in this case the natural gas is quite devoid of moisture, either water or hydrocarbons.

By bubbling the gas through the oil in the second chamber, any water carried over from the caustic soda chamber will settle out on a gravity basis, provided it is not in the vapor state. The oil used is crankcase oil drained from the engines at oil-changing time.

Considerable success in stripping gas of water content and hydrates has been obtained with an arrangement similar to that described in the article mentioned. Two sections of casing (diameter varies from 7 to 15 in.), anywhere from 6 to 12 ft. in length are used. The gas enters at a point 1½ to 2 ft. above the bottom of one chamber, leaves the top and enters the second chamber near the bottom, again leaving from the top. A few operators use a small amount of oil in the first chamber, the intent being to aid in the trapping of the water. The oil is not essential to the operation, although it can do no harm and might do some good.

A variation of the above, used where the moisture content is not great, is to place one chamber on top of the other and connect them with several small-diameter pipes. Again a small amount of oil may be used in the bottom chamber. This method is not recommended as standing the chambers upright produces much better results.

Principal point in building such traps is to make them as tall as practicable so the gas exit is some distance from the fluid level. Also the velocity of the gas must be kept low.

As such traps are for the removal of moisture condensing in the gas, they should be installed at a point where moisture has formed or is forming. In a case where gas is obtained from a plant, the water knockouts are installed some distance from the compressors so that most of the condensate has already formed before entering the traps and will drop out there. If the knockouts were installed on the discharge lines at the plant, they should probably be relatively ineffective as liquid formation would not have started and a large portion of the water vapor would carry on through to condense later.

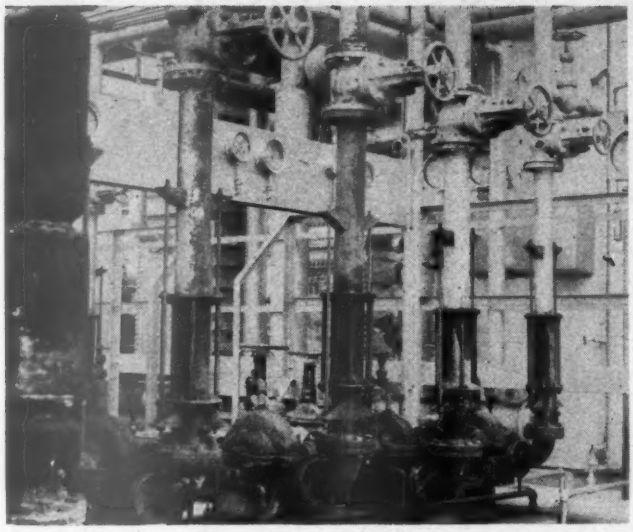
The traps, of course, are equipped with valves on the bottom so that any collected moisture may be drained off. Some success has been obtained with a simple float installed in the traps which automatically shuts off the gas whenever the liquid level gets too high. This is not necessary as the pumper can drain the traps as part of his daily routine.

The role of the lubricating oil used in such systems is probably minor and is strictly mechanical. The beneficial effect obtained is due to the gas passing rather readily through the oil while the moisture is held back.

The principal points in designing moisture traps on gas lines are, as mentioned above: (1) As much space as possible between the liquid level and the gas exit, and (2) a low gas velocity. Where an oil drum, or a single volume tank lying on its side, is used the level of the fluid is not very far from the gas outlet. Increasing the height of the vessel by welding two oil drums together or standing the volume tank on end and admitting near the bottom and emitting from the top will produce much dryer gas. Using two oil drums, or two chambers made from casing, in series, will also produce better results.

There are several commercial methods for dehydrating gas, the principal ones being the diethylene glycol and the activated alumina methods. These can be used where fairly large volumes of gas are being handled but for application to small isolated installations, such as engines on pumping wells, the use of moisture traps, or knockouts, described above is more practicable.

# PLANT PRACTICES

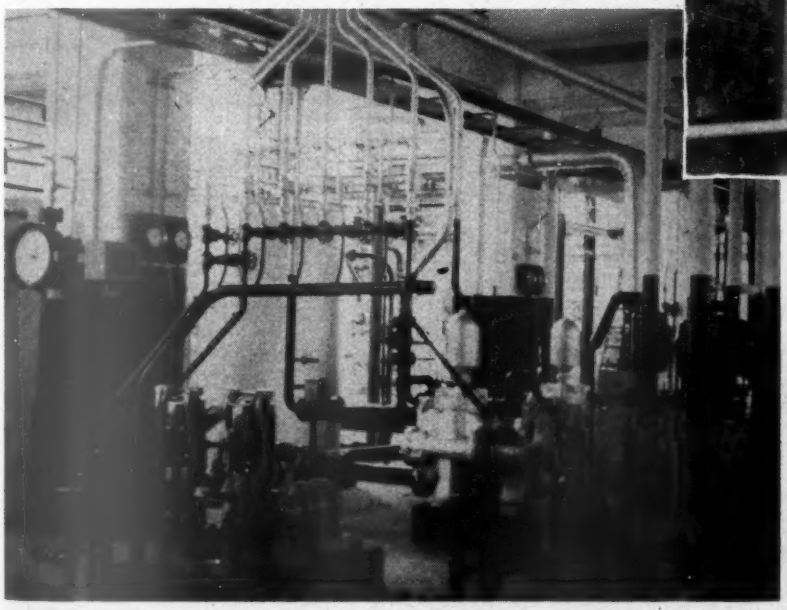


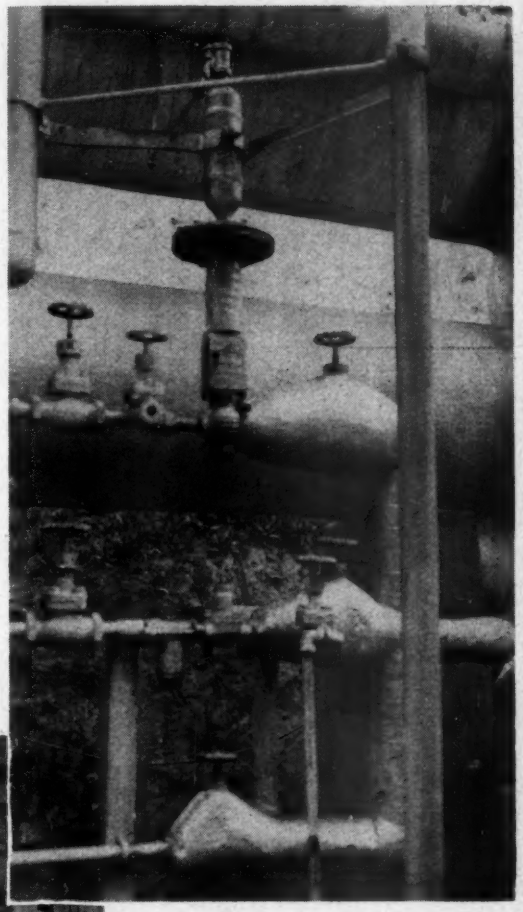
## Bolted Sleeve Couplings for Pump Riser Support

CENTRIFUGAL circulating pumps in a large California refinery have vertical risers to overhead lines. To shift some of the excessive weight of these risers from the pump castings bolted pipe-line couplings are installed in the risers immediately above the pump-discharge fittings. The type of gaskets between the sleeves and the flanges are selected according to the kind of material being handled so that leaks will be eliminated. Lugs welded both above and below the couplings are used with extension rods to support the lower fittings and prevent misalignment because of creep.

## Savings by Grouped Proportioning Pumps

WHEN several points of injection of chemicals are required, the proportioning pumps can be set as a group with the discharge lines connected to a manifold for subsequent distribution as shown in the accompanying picture. The kind and quantity of chemicals determine how many branch lines can be attached to one pump, but such an installation can save much time for the maintenance man and make possible more efficient operation.





## Brace for Heavy-Duty Control Valves

WHEN heavy-duty control valves are installed on small lines, the pump vibrations in the plant contribute to breaking connections. This may be prevented or subdued by bolting flat braces to the top of the instrument and to adjacent heavy risers or stanchions, as was done in this refinery installation. The braces are made with clip ends so that small bolts can be used when installing and easily disconnected if the instrument requires overhauling, repair or any type of maintenance.

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Pushing stubby assault boats ashore, through withering enemy fire, storming the beaches and mopping up enemy strong points—advancing inland to take and hold strategic airports, towns, road and railroad junctions—there is more to a successful invasion than these stirring deeds of U. S. fighting men in North Africa. To make that invasion possible, to make it *stick* till all objectives are fully attained, takes the brains and brawn of thousands of men who may never get to see the fighting at all—sailors on escorting warships, seamen on transports, dockworkers and stevedores to load and unload thousands of tons of equipment and supplies. It is these men and their ships *and their rope-equipped machinery* that make up the physical basis of *logistics*—the art and science of getting there first with the most and *staying longest!*

It's a tough job, meeting all the needs of a sizeable army in the field against a powerful enemy. Army Engineers and special stevedore units, Navy crewmen, merchant seamen—all of them swing to with a will. And they keep the ammunition coming for men and guns. In many of these places where the going is tough today, Roebling "Blue Center" Steel Wire Rope is in there swinging. Bringing to this tough job too the extra values built into it by Roebling Engineers out of their experience in the field—in Roebling's mills—in Roebling Development Engineering. Meeting unfailingly all the demands of Victory.

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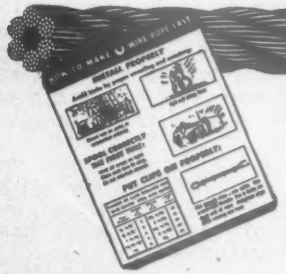

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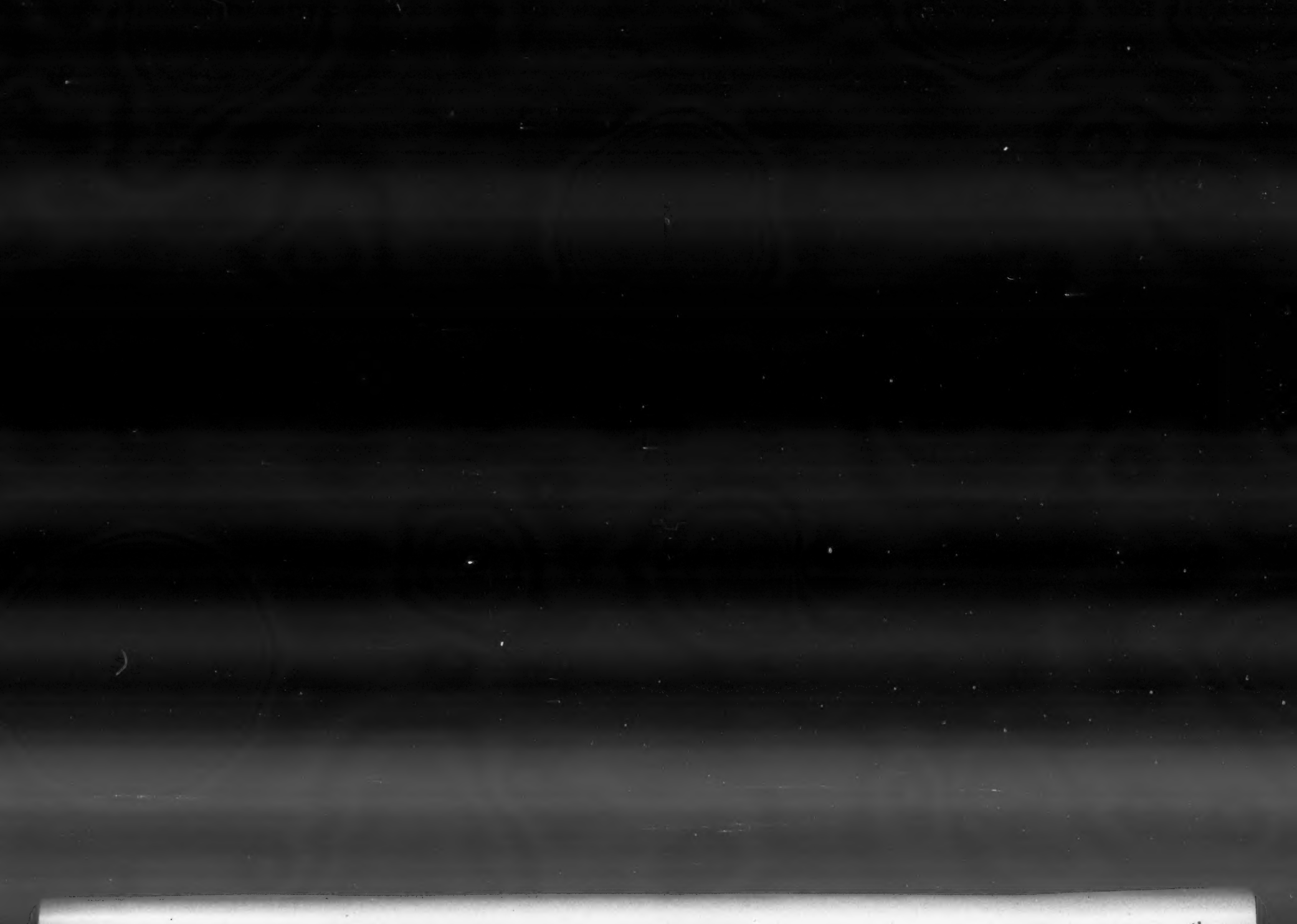
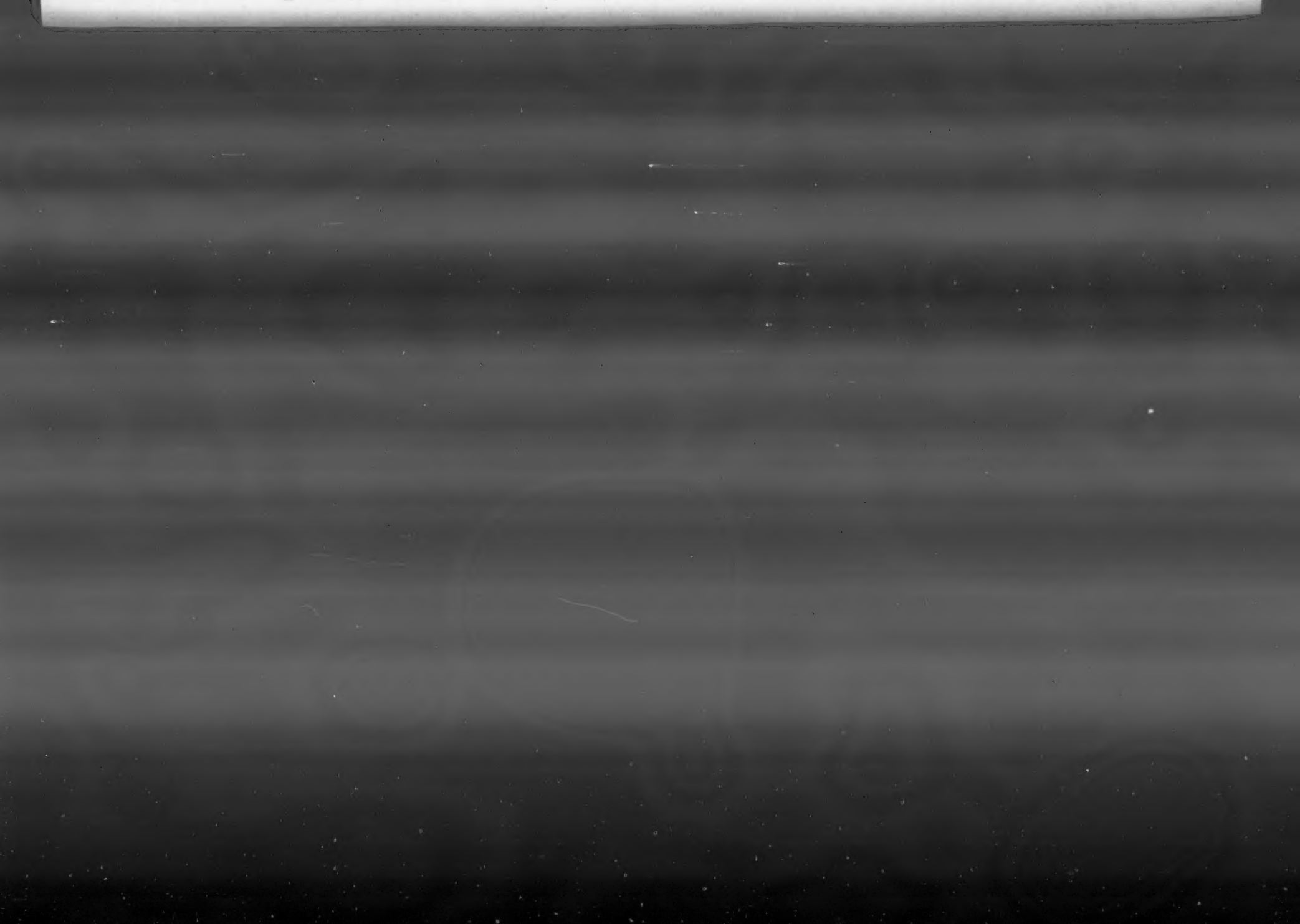




# QUESTIONS on TECHNOLOGY

*by W. L. Nelson*

## Weight and Cost of Fractionating Towers

**In your Practical Refining papers you might also tell how to estimate the cost of fractionating towers. Can you give us a shortcut method?—I. N. N.**

Fractionating towers are built in so many thicknesses, with or without manholes, and with such a variation in number of trays, that no very simple method can be devised. Finally, the cost of plate steel is by no means constant.

The main parts of a fractionating tower, for the purpose of estimating weights and costs, are somewhat as follows:

Related to height:
1. Cylindrical shell.
2. Insulation rings.
3. Ladders or stairs.
4. Insulation (and scaffolding).

Related to number of plates:
5. Plates and caps.
6. Manholes.
7. Downspouts, weirs and baffles.
8. Tray supports.

In addition, nearly every tower is equipped with a foundation, structural steel at top, platforms, manholes at top and bottom, downplates or connections, foundation ring, connections for feed, reflux, etc., etc. An equation relating these many variables would not be of much value and hence, only this general discussion will be given.

For ½-in. plate in all parts except the head and bottom, which are ⅝-in., the weights of the various parts are somewhat as follows:

Shell—64 lb./ft. dia./ft. height.

Insulation rings—1 lb./ft. dia./ft. height.

Ladder—18 lb./ft. height.

Plates—14 lb. times sq. of dia./tray.

Downspouts—430 lb./ft. dia.

Tray baffles—3 lb. times sq. of dia./tray.

Manholes (18-in.)—300 lb. each.

Caps—3 times sq. of dia./tray.

Thus, the approximate weight of the main bulk of a ½-in. wall thickness tower may be expressed thus:

$$\text{Pounds} = 1.05\,[65DH + 17D^2(N + 3) + 18H + 430D + 300N]$$

in which D is the diameter in feet, H is the total height in feet, and N is the number of trays. The cost of tower steel ranges from 20 cents per pound down to 12 cents per pound for very large towers (including prefabrication labor or field fabrication) but it should be noted that the cost of steel varies widely.

In addition, the cost of caps, insulation, scaffolding, platforms (and their structural steel) and labor of field erection, must be added to the cost of the steel.

## Market Products Now And in 1900

**I have several editions of Petroleum Facts and Figures but I am not sufficiently familiar with the refining end of the business to be able to list the products that are being sold. What was the number of products and by-products being made by refineries in 1900, and what was the number for the year 1942?—J. A. V.**

A direct answer cannot be made to the specific questions but some grasp of the situation can be had from the following discussion.

Several of the factors involved in an attempt to enumerate the number of refinery products being sold are:

1. Substantially all of the crude oil being processed (whether 1860, 1900 or 1942) has been sold as some type of product. The type of product sold is related to the economic situation at that time and hence the use of petroleum oils for certain purposes may have been discontinued, as well as a continual appearance of new uses for petroleum oils. Recall that from 1860 to 1905 the material which we sell as gasoline was a drug on the market and could therefore be used for many services, such as a fuel for heating purposes, which could not be contemplated today.

2. The naming of petroleum products is very often based on what the product is to be used for. This adds numerous names to the list of products, all of which could be supplied from a single tank (or product) by the refiner. Thus, aviation gasoline and stove gasoline (air-pump lamps and torches) are substantially the same material—and if solvents (or naphthas) are considered it will be found that a single boiling-range product may be named in 5 to 15 ways (see this page April 15, 1943, p. 134).

3. The crediting of petroleum as the source of certain byproduct materials is confusing and in many instances misleading. Thus, much of the ethyl or grain alcohol used commercially today is made from petroleum gases, and yet it would be misleading to list the several hundred products that are made from alcohol as products of petroleum even if they do stem remotely from petroleum by a series of 2-10 chemical reactions. In other words, where should the line be drawn?

One further example, butadiene is made from petroleum or natural gasoline. This material along with various other chemicals is used to make 5 to 10 commercially important synthetic rubbers or plastic materials (as well as perhaps 50 other plastics in small amounts). Is it proper to list all of these products as being made from petroleum or would it be more consistent to say only that butadiene is made from petroleum?

The grouping of materials into general classes would indicate little difference between the situation in 1900 and what we find today. This is particularly true if the grouping is arranged by a refiner rather than by a purchaser. In looking over the listing given on pages 13 and 14 in Petroleum Refinery Engineering (McGraw-Hill Book Co., Inc.) it is found that the products for the year 1900 would be about the same as those made today. The same situation is indicated by the groupings used in the 1900 census of manufacturers and the 1940 census. The listings are as follows:

**1900 Census**

Illuminating oils
Fuel oil (including gas oil)
Lubricating oil
Paraffin oil
Reduced oil
Neutral oil
Cylinder oil
Naphtha and gasoline (including gas naphtha)
Miscellaneous other oils
Paraffin wax
Oil asphalt
Residues or tar

*(Continued on Page 70)*

# Electric Bonding Saves Vital War Materials by Metallizing

*by L. E. Kunkler**

**An electric method of building up a base layer of metal as the beginning of the metallizing operation improves the job and aids in saving critical war materials by making available equipment last longer, do a better job. The density of the deposited metal layer is determined by the depositing air pressure employed—the higher the pressure the finer-grained, more dense deposit obtained.**

TODAY metallizing—a method of salvaging worn metal parts—is playing a big part in our Victory drive to conserve vital war materials. It is also eliminating many costly periods of shutdowns in industry and effecting drastic reductions in mechanical maintenance costs. Such repair and salvage can be done by relatively unskilled labor at amazing low cost.

The worn parts of machines, ships, planes, automobiles, trucks, railroads, buses, etc., are today being built up quickly and economically through metallizing. Metallizing can be used in place of tinning, galvanizing, calorizing, electroplating and welding under certain conditions. In most of these processes there are definite limitations as to the size of the job which can be treated. There are also certain limitations as to the metals which can be used. Metallizing, on the other hand, has none of these drawbacks nor is there any danger of distortion due to heat.

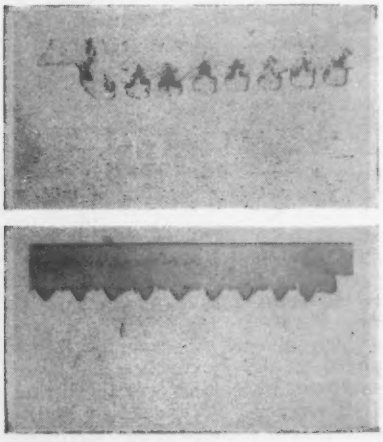


*Fig. 1. Unetched cross-section of a metallized shaft on which bronze has been deposited, contrasting the torn V-thread method of preparing the bottom of a cut on which metal is to be deposited (lower), with knurled round-bottom thread (upper). Magnified five diameters.*

Metallizing is not an experimental process. It has been developed and improved over a period of years. The Metallizing Co. of America has done much to stabilize the business and assist users of its equipment. Metallizing is a new and modern way of building up worn parts, improve operating surfaces and make exposed areas corrosion resistant and hard surfaced.

Metallizing is accomplished with the Mogul metallizing gun. The metal to be sprayed is fed in wire form into the back of the gun and a 3½-in. diameter balanced turbine propels the wire with uniform speed. The wire is led into the nozzle where it is melted by either acetylene, propane or generated gas flames combined with oxygen and the molten metal is discharged from the gun in a microfine spray by air pressure. This steady wire feed, together with the proper heat and air pressure of the Model "P" gun assures higher speed operations as well as a finer, denser deposit which makes the metallized part more readily machinable.

*Fig. 2. Refinishing a journal on the crankshaft of a pumping engine, a practice which may be used for engines, pumps, compressors, etc., in the oil refinery or field.*

### Preparation of the Part for Metallizing

In preparing the part for metallizing it is necessary that the proper metal be chosen for the service involved. If service requires both wear and corrosion resistance then 13-16 per cent chrome steel wire will be the best to use. If wear alone is the important consideration, either a 1.20 per cent carbon steel or a 1 per cent carbon and 2 per cent chrome steel wire will be satisfactory. Where corrosion alone is the factor, either stainless steel, one of the bronzes, or a high carbon iron will be used depending upon the chemical condition encountered. Once the best wire to use has been determined, the part to be metallized is placed in the lathe and the trueup cut taken over the entire length of the worn surface, overlapping at each end about ¼ in., so there will be no joint coming under the packing. The cut should be deep enough to allow for future wear without exposing the base metal. On rods 1 in. diameter or more it is customary to undercut 3/32 of an inch on the diameter. For small rods this can be reduced to $\frac{1}{16}$ in. It is important that the rod is cleaned with emery cloth for a distance of about 1 in. beyond the undercut section. Likewise, the shoulder at each end should be squared using a cutter-

*Metallizing Co. of America.

# We Made a Mole Hill Out of a Mountain

**Bigelow-Liptak engineering and construction methods solved the problem of directing large volumes of acid-laden, low temperature gases from a series of process furnaces to an exhaust chimney.**

THE PROBLEM that faced one of the country's largest copper smelters was a tough one. A satisfactory and economical means had to be developed and constructed for carrying off large volumes of acid-laden gases from process furnaces to a chimney.

Due to the enormous volume of gases being released, any flue for handling them would necessarily involve large exposed areas. Such a flue, necessary for directing the gases, would have to be designed for maximum wind load and made weather proof. Also it would have to be air-tight to maintain a relatively high draft or negative pressure.

In order to sustain a temperature high enough at the base of the stack to create the necessary draft, a method for assuring a reasonably low conduction heat loss for the entire flue had to be worked out.

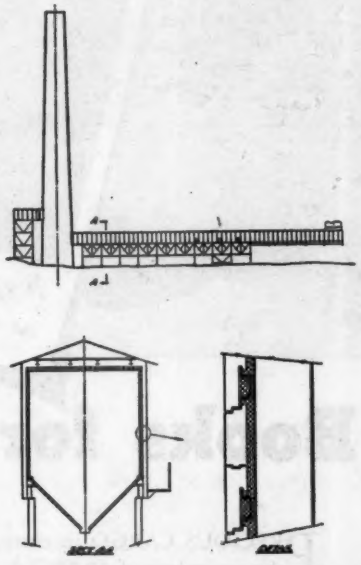
Another factor added to the problem. Adequate provisions had to be made for taking care of the great amount of thermal expansion that would naturally occur in a flue of this length. In designing the flue, means of compensating for this expansion would have to be incorporated in the design.

As should be the case, costs had to be an important consideration. Any passage devised would have definite price limitations and the design had to be economical.

## The Solution

Bigelow-Liptak engineers visited the job. A complete survey of the problem and all its factors was made and studied. Preliminary drawings for the general design of a flue were made right at the job site. Later, back in the general office complete and detailed drawings were developed and studied by the Bigelow-Liptak engineering staff. A thorough analysis was made of the thermo-dynamics, the mechanics of materials and the ceramics.

As a result of this careful analysis and study, a thoroughly satisfactory and economical means was worked out for directing the acid-laden gases from the furnaces to an exhaust chimney. Recommendations were prepared and cross section drawings of the entire flue — as shown — were submitted.



Unit-Suspended side walls and arches were used for the 350 feet long flue areas. Special acid-resisting refractories were selected. Because of experience, Bigelow-Liptak knew that this type of acid-resisting tile should be manufactured on extrusion machines. This was important in designing the tile, as all special shapes would have to be designed to conform to this process without sacrificing any of the advantages of Unit-Suspended construction. Air tightness and low heat conduction losses, being a natural feature of Bigelow-Liptak Unit-Suspended construction, were easily incorporated into the design, once the major problem had been solved.

Bigelow-Liptak's exclusive designs made possible an uninterrupted weather proof insulation shield or encasement —thereby eliminating the need of critical steel plate—a factor of considerable importance today.

Because of the acid in the gases, ordinary expansion joints could not be used to provide for the expansion and contraction. A special fibre glass had to be employed.

By applying Bigelow-Liptak engineering skill and principles, the problem of finding a satisfactory means of transferring acid-laden gases to an exhaust chimney, was solved.

### What This Means To You

The significance of this problem and its complete solution by Bigelow-Liptak is much greater than any resemblance it may have to any of your problems. It serves to demonstrate the value you may receive by taking your problems to Bigelow-Liptak regardless of their type or size. Bigelow-Liptak's wide experience in designing enclosures includes every type of problem having to do with thermo-dynamics, ceramics and mechanics of materials. With Bigelow-Liptak there is no standard or set solution for every case. Individualized engineering, based on years of experience and sound engineering principles, is applied towards giving the customer the best and most economical solution to his particular needs. Our policy is to give first and foremost consideration to the needs of the user.

**Engineering Information No Obligation**

Our engineering staff will be glad to send you interesting catalogs or tell you how you could secure increased service and economy by the use of Bigelow-Liptak Unit-Suspended walls and arches in your plant. Write today. Bigelow-Liptak Corporation 2842 West Grand Blvd. Detroit

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## AMERICAN BOSCH

AVIATION AND AUTOMOTIVE ELECTRICAL PRODUCTS . . . FUEL INJECTION EQUIPMENT

MODERN CRAFTSMEN IN THE NEW ENGLAND TRADITION

off tool. The bottom of the piece at this point should have a small radius to prevent any tendency toward starting a crack.

### Rough Threading

One of the methods for preparing a part for metallizing is known as the rough-threading method. An ordinary threading tool which has had the side clearances ground away and the point slightly rounded is used. The point of the tool is set about $\frac{1}{16}$ in. below the center of the rod, and with the spindle speed reduced by the back gear, a thread is run the entire length of the undercut area (24 threads per inch). The object of this operation is to obtain a thread with a smooth bottom and well torn sides giving thousands of interstices for sprayed metal to adhere to. Not all alloys will require the same tool settings or speeds to obtain uniform results. Some alloys will require different speeds and tool settings than others.

After the rough-threading operation has been completed, it is important that the surface be protected against contamination. It is best, of course, to spray the rod as soon as the threading has been completed. If the part which has been prepared is to be left for any length of time, it should be wrapped with clean paper for protection. When the part is left exposed for any length of time, atmospheric deposits are apt to cause trouble. This is particularly true of wet humid days. On the other hand, when the humidity is low, as much as 24 hours may elapse without any danger of contamination occurring.

### Sand Blasting

In view of the fact that some alloy shafts are either case-hardened, nitrided or so hard throughout that ordinary machine tools cannot be used to undercut the worn area, sand blasting must be employed as a means of preparing the metal. In this operation it is necessary to grind the worn metal away, mask the ends and sand blast thoroughly. Whenever possible it is well to use a diamond point chisel to nick the area before sand blasting.

In preparing used cast iron, bronzes or brass casting for metallizing these metals must be heated to the point to drive off any oil or grease that may have been absorbed. This heating, naturally should be done with care to avoid warping.

This same condition is likely to be found in previously welded shafts. Since the base metal rarely gets hotter than about 200° F., crankshafts, high-speed shafts, armatures, may be processed in this manner without any danger of warpage or distortion from heat.

### Electric Bonding Method

The third and newest method of preparing surfaces for metallizing is the electric bonding method. This process employs rods for bonding which may be obtained at any welding source. One, two or three-foot lengths of metal wire in any of the following metals may be used to perfect the bond:

1. Pure nickel, rod or wire.
2. Monel.
3. Nickel alloy.

One feature of the Mogul electric bonder is that through its use it is possible to exert localized control in operation of metal preparation. It is also possible to prepare other metals such as bronzes and brass or those metals that do not contain a high percentage of lead. Hard to get at places can be prepared and parts which are apt to be damaged by sand blasting can be prepared without any fear of injury. Thus the masking off of certain parts for protection—essential in the sand blasting—is not required with this process.

The new bonder makes it possible for the operator to get into small corners and into internal diameter easily. It is possible to bond a cylindrical surface with approximately the same speed as rough threading.

One of the most important features of this bonder is the air-cooled electrode holder. Its construction is simple. It provides absolute safety to the operator. The electrode itself is kept cool at all times permitting high-speed bonding. It uses but one electrode and high-speed efficiency in applying the bond is obtained without any high peaks on the metal surface. It eliminates entirely the possibility of excess carbon or dirt getting into the work which might have a tendency to give a false bond.

The air-cooling system employed eliminates the possibility of the work becoming overheated, prehardened or distorted. The air cooling also serves to accomplish other needs in the bonding operation. It keeps the work clean and free from excess carbon deposits; it blows the flash sparks away from the operator; it maintains the control of the temperature of the electrode wire; and probably most important of all, it controls the density of the deposit.

At high pressure, that is, 75 lb./in.$^2$ a very fine and very dense deposit is obtained. High pressures are used for certain emergency jobs—filling in cracks such as blocks and press fits, etc. By reducing the pressure to 30 lb./in.$^2$ the denser, coarser bond is obtained. Naturally at slower speeds more air will be required for cooling. With this bonding machine the operator has a wide selection of deposit factors when lathe speeds, surface diameter, air variables and current selector combinations are used.

### Spraying Technique

With the metallizing gun mounted in the lathe tool post, adjustments are made in the gas pressure of the gun and it is moved opposite one end of the prepared rod. The gun is lighted and pointed away from the work until complete atomization is attained. The shaft part to be sprayed should be sprayed from the center until the part is built up enough over

*Fig. 3. A rebuilt, metallized shaft finished and ground to size. In this manner a metal which is more suited to the specific conditions to be met may be deposited on an old shaft, giving longer life than the original shaft could give*

*Fig. 4. Special assembly showing how an extension on the metallizing gun may be used to rebuild surfaces such as the inside of an engine, pump or compressor barrel or cylinder. This is one of the most useful applications of metallizing, permitting the reuse of equipment which cannot be replaced at present. Even in peacetime, this operation will extend the life of equipment and reduce equipment over-all costs*

size to allow for finishing. When one spot is built up sufficiently the carriage is moved along enough to start a new one and continue in this manner until the shaft is built up for its entire length. Unless it has been necessary to undercut the part very deeply it is best to build up with one complete pass of the gun.

If the finishing is done in the lathe, the work can be started as soon as the spraying is completed. By the time the rough threaded sand blasted or electric-bonded surface has been completely metallized the part will be cold enough to finish to size. Where grinding facilities are available it is always best to grind the finish regardless of the type of steel used.

—TECHNICAL QUESTIONS— .....

The Metallizing Co. of America has never recommended any other means of preparing parts for metallizing other than rough threading, sand blasting or electric bonding. In other words, the use of knurling as a means of preparation is not recommended. A recent test made by a laboratory of an eastern corporation using metallizing equipment proves rather conclusively that the method as recommended gives a decidedly better bond. The photomicrograph shows two bonds, one made using the method as recommended, the other by the knurling method using knurling tools. The dark areas show the nonbonding surfaces—very noticeable in the knurled surface—but in no way apparent with the surface prepared with recommended equipment.

Surfaces which have been sprayed by this process are very strong and durable. It is not necessary to apply a heavy coat of metal to them. It has been found that a thinner coat, being less rigid, is sufficiently strong to stretch the amount necessary for it to follow the base metal. While each metal has a different thickness limitation, generally the thinner coat is better than the heavier.

Another important application for metallizing in maintenance is the protection of various metal surfaces from corrosion. Such surfaces are prepared for metallizing by sand blasting, using steel shot in the blasting operation. However, in warm coastal areas it is impractical to use steel shot because the salt air causes it to rust. This rust is transferred to the surface to be sprayed and it is impossible to get a good bond for spraying. Therefore, in areas where steel shot cannot be used, flint grit is recommended. This should be very sharp since it is not only necessary to clean the surface thoroughly but to produce a keyed surface to which the tiny metal particles may cling.

In spraying flat surfaces, the thickness of the applied metal is definitely limited. Too heavy an application is not recommended since if too much metal is deposited its strength becomes such that the mechanical bond is sheared when the base metal expands or contracts.

# Questions on Technology

*(Continued from Page 65)*

Greases (lubricating)
Coke and black naphtha
Miscellaneous other products

**1940 Census**

Gasoline—aviation
Gasoline—others
Naphtha (including benzine)
Kerosene
Fuel oil—distillate
Fuel oil—gas oil
Fuel oil—residual
Miscellaneous refined oils
Lubricating oil—neutral
Lubricating oil—cylinder
Lubricating oil—black
Lubricating oil—others
Road oils—liquid
Road oils—other
Residuum or tar
Greases—petrolatum
Greases—lubricating
Paraffin
Acid oil
Liquefied petroleum gases
Asphalt
Coke
Miscellaneous products

An interesting listing of uses of "petroleum" is that of the London County Council (Nov. 14, 1890) as given in "A Treatise on Petroleum," Vol. 3, pages 991-993, fifth edition, Charles Griffin & Co., Ltd., 1926. The following businesses are listed and they are remarkably similar to a listing of the uses of solvents at the present time:

Dry cleaners
Helmet manufacturers
Tennis shoe manufacturers
Indian rubber manufacturers
Waterproof garment manufacturers
Glass silverers
Paint manufacturers
Glove cleaners
Bone boilers
Bedstead manufacturers
Photographic chemical manufacturers
Manufacturing chemist
Brassfitter (asbestos packing)
Paraffin scale maker
Electricians
Color printing works
Toy balloon makers

About the only way that a comparative listing could be obtained would be to list as uses or names of materials that are used in amounts exceeding say 0.1 per cent of the crude-oil production at that time. Even this would be somewhat misleading because the variety of large-scale uses in 1900 may exceed those now existing because of the extremely large percentages being used today for gasoline and fuel oil. There are literally hundreds of uses for petroleum products today if the listing is carried far enough (perhaps even 1,000 if all special lubricating oils are listed), and somewhat the same would be true of the year 1900 except that all of the uses at that time have certainly not been listed in print, and the total uses in 1900 would certainly not have been as many as 1,000.

Finally, a chronology of market demands is given in Petroleum Refinery Engineering, second edition, pages 9-11, McGraw-Hill Book Co., Inc., 1941. This chronology indicates the entrance of petroleum oils into new major fields of service at about the following dates:

1855-1860—Burning oils (replacing sperm and coal oil).
1885-1900—Lubrication (replacing vegetable and animal oils).
1900-1914—Motor fuel (new field).
1935-1941—Chemical manufacturing (some replacement and some new fields).
1941-1944—Rubber manufacturing (replacing natural rubber).

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ANACONDA

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# Short Steel Bar Cause of Unexpected Fishing Job

**by Harry F. Simons**

THE most intriguing part of fishing on a well being drilled or reconditioned is that anything can happen—and usually does. Determining just what is causing the difficulty is in many instances largely guess work. Frequently the inability to determine the cause of the trouble leads to abandonment of a well.

A recent fishing job, which was cleaned up successfully in less than a day, was caused by an unusual circumstance which was not revealed to the crew until the drill pipe had finally been pulled from the hole. Then it was discovered that a bar about 3 ft. in length and approximately 1 in. in diameter had been dropped in the hole and had caused the freezing of the drill pipe.

The well was the Siemoneit Drilling Co. 1 Walsh in the Abell field of Pecos County, Texas. This field has been outstanding for its drilling difficulties and for its rather numerous producing horizons. The well had been producing from an upper zone with a total depth of 4,989 ft. and is currently being deepened to the Ellenburger.

Drill pipe with a 6¾-in. bit on bottom was being run inside the 7-in. casing and when a depth of 2,356 ft. was reached it became stuck. Troy Duke, drilling and production superintendent for Siemoneit Drilling Co. was called and supervised the job of getting the pipe from the hole. The most obvious assumption was that the casing had collapsed or buckled.

As the pipe would not go up or down an effort was made to twist it in hopes of freeing it. After several hours of working the pipe it became possible to lower it but impossible to raise it. More working and alternate twisting, lowering and raising of the pipe finally permitted it to be raised although it continued to drag.

From the conditions it was apparent that collapsed casing was not the difficulty but that something had been in the hole and whatever it might be, it was hanging on the bit. The surface connections for controlling the well were unflanged and the entire assembly raised so that the offending item would not have to be pulled through them. Unfortunately, the drill stem hung up when the bit still lacked a few feet of being out of the hole and considerable strain had to be used to free it. When it finally came free, the pipe jumped upward several feet and it was feared that the fish had been lost. This, however, proved not to be the case.

A 1-in. steel bar was wrapped once around the bit with the remainder hanging at a 90° angle much like an offset-type hanger used to handle heavy objects and something like a pot hook. In endeavoring to drive it off of the bit with a sledge hammer, one of the cutting elements

*Troy Duke, drilling and production superintendent of Siemoneit Drilling Co. with the 1-in. steel bar recovered from the company's 1 Walsh in Abell field, Pecos County, Texas*

of the bit broke off due to its having been weakened by the pulling and rotating by which the bar was wrapped around the bit. The fishing job could have eventually developed into one where the cutting elements had been pulled off of the bit and it then would have been a problem of getting an unknown object out of the hole plus recovering these cutting elements.

Needless to say, the crew was more than surprised when they learned what had caused the difficulty as no one suspected the presence of such an object in the well. There had been some previous work done on the well but not by the drilling crew and it was evidently during the former work when some workman accidentally dropped the bar in the hole and neglected to mention it for fear of discharge. If the presence of the bar had been known, measures could have been designed to recover it before running drill pipe in preparatory to deepening.

As it was, the entire investment in the well was jeopardized by concealing the presence of the bar in the well and it was only due skill and good fortune that the hole was not lost or a lengthy fishing job incurred. Approximately 8 hours elapsed from the time the pipe stuck until the bit and the bar were on the derrick floor.

# BOOK REVIEWS

*Manual of Welded Steel Tubing for Heat Exchanger and Condenser Use. Formed Steel Institute, 1621 Euclid Ave., Cleveland, Ohio. 20 pp.*

One section is devoted to an illustrated description of the welded tube manufacturing process, with special reference to the numerous tests that are used for checking and controlling the quality of all welded tubing produced for this application. Also included is a discussion of the method used to identify each welded-tube manufacturer's product. Later portions of the manual furnish fabricating data and extensive tables of tube properties, for use in calculating surface areas, carrying capacities, displacements, etc.

*Symposium on Radiography. American Society for Testing Materials, Philadelphia, Pa. 256 pp. $4.*

The book includes 18 technical papers presented by outstanding authorities. The major part of the book includes the technical contributions in the 1942 symposium but an important part is the collection of 1936 papers, some revised and some condensed.

*Tulsa: From Creek Town to Oil Capital. By Angie Debo. University of Oklahoma Press, Norman, Okla. 123 pp. $1.50.*

In writing a previous book the author collected more material about Creek history than it was possible for her to use. She used the overflow in the present book, adding, she says, some rather obvious newer material to bring the narrative up to date. She has achieved a readable little volume.

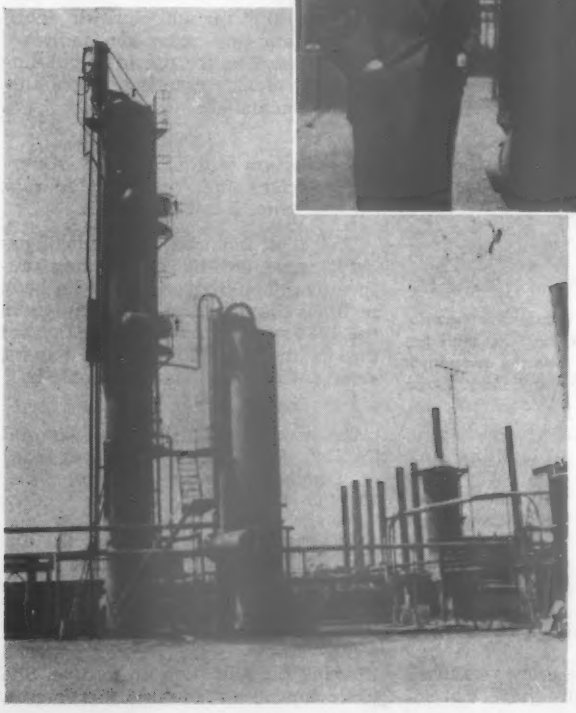
# California Plant Adapted to Refine Sulfur Crude

LOS ANGELES, Calif. — By redesigning and expanding its refinery near Santa Maria, Calif., the Bell Oil & Refining Co. has not only increased its capacity but has been enabled to process the low-gravity, sulfur-bearing oil of the Santa Maria Valley district more efficiently. It has been believed by many that profitable operation could not be achieved with a refinery charged exclusively with this crude and having no outlet except by tank car and truck; and the small plant from which the present refinery was developed was not a successful operation. The present management, however, took over the refining operations a little more than 3 years ago and has met the problems encountered by redesigning the plant to secure greater flexibility of manufacture; by expanding it to make the operation profitable; and by providing for transportation of refined products by leasing a sufficient number of tank cars to insure shipments without interruption. Construction work was completed in May 1943 and the plant now has a capacity of 7,000 bbl. of crude oil per day.

The main product of the refinery during the greater part of the year is road oil and asphalt. An average of 14 per cent of the output, however, is high-grade gasoline meeting Army specifications with an octane rating of 80 and above. A considerable amount of fuel oil is also manufactured and the stock below gasoline can be proportioned to fuel oil and asphalt manufacture as the relative demands for these products dictate.

Although the redesign and expansion of the plant were made to meet peacetime requirements, its location has made it of considerable value to the war effort in California. There are a number of Army camps in the territory surrounding the location and the gasoline is transported by the company's trucks to these camps.

*J. H. Gilliland, president and general manager of Bell Oil & Refining Co.; L. A. Davis, treasurer, and N. F. Tyacke, refinery superintendent*



*A section of the Santa Maria Valley refinery converted to handle heavy sulfur-bearing California crude oil*

Most of the crude is brought in by an 8-in. pipe line from the Santa Maria Valley field in which the refinery is located. This provides a low crude-to-refinery transportation cost. This crude ranges in gravity from 13° to 17° A.P.I. A small amount of crude is transported by truck from the Lompoc field, however, and this oil, having an average gravity of 20° A.P.I., raises the average through the plant to approximately 15° A.P.I.

The main equipment in the refinery, in addition to pumps, condensers, storage tanks, cooling tower and other auxiliaries, consists of a crude pipe still, a viscosity breaker, an evaporator, two fractionating towers, a stripper and gas separators. The gasoline-treating plant includes an acid tower, acid settler, clay tower, and caustic tower. The white gasoline is treated in an Ethyl blending plant for producing premium gasoline. Automatic controls are used throughout the refining operations. A testing laboratory has been newly equipped, capable of testing all products.

### Characteristics of Road Oil

The products below gasoline are not desulfurized and since the crude is an asphaltic base, no lubricating oil is produced. The road oil and asphalt is mainly 200-300 penetration and is the residuum from the evaporator into which the crude flows after passing through a crude pipe still. When desired, lower penetration cuts, controlled by temperature in the crude pipe still, are taken. Higher penetration cuts can be taken off direct by heat control or can be made by blending with distillates in storage or by a combination of both methods.

Fuel oil is manufactured in several grades, the two principal grades being specified as heavy fuel and light fuel. Total fuel-oil production averages 1,500 bbl. per day. Since it is processed from the sulfur-bearing Santa Maria crude it contains a maximum sulfur content of 5 per cent; but, contrary to earlier conceptions, the fuel has been found satisfactory.

The fuel oil is processed by passing the residuum (which remains after the gasoline, kerosene distillate and gas oil is taken off) through a viscosity breaking still and passing this heated residuum through a fractionating tower to take off cracked naphtha.

All the gas taken off during distillation is utilized for fuel, but since this is inadequate for plant operation, from 1,500,000 to 2,000,000 cu. ft. per day has to be purchased.

Operations of the refining company are under the direction of Joseph H. Gilliland, president and general manager; the marketing of the products is handled by W. F. Lyte, vice president in charge of sales. The plant is operated by Norman F. Tyacke, superintendent of the refinery.

# *Geared* to the tempo

## IN WAR OR PEACE!

**THE MAGNIFICENT PART UTILITY ELECTRIC POWER IS NOW PLAYING IS SMALL COMPARED TO POSTWAR POSSIBILITIES**

What a heartening sight . . . American industry tooled-up and geared-up for the final "kill". It's enough to make a believer out of the most skeptical.

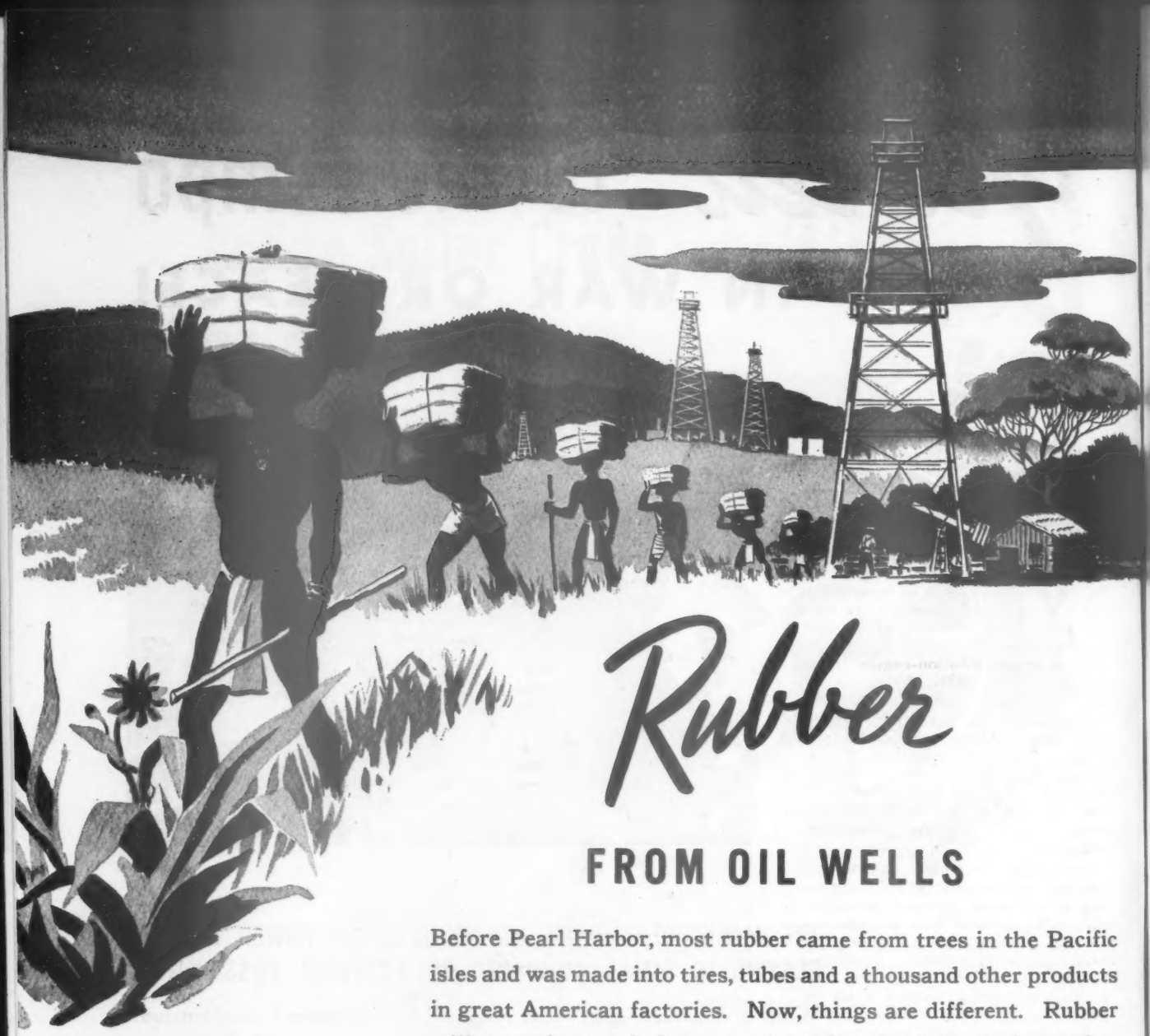
But it's hardly reasonable to assume that the war will be won without further strain on the petroleum industry. More and more oil is required every day. And more and more Utility Electric Power is needed to bring this oil supply into use.

So when the time comes for further expansion of petroleum operations, and critical materials become more available for power installations, be ready to install Utility Electric Power. In fact, it's not too early now to plan for postwar electrification of your properties.

Remember . . . Utility Electric Power is geared to today's tempo whether war or peace!

*Use Utility Electric Power!*

PETROLEUM ELECTRIC POWER ASSOCIATION



# *Rubber*

## FROM OIL WELLS

Before Pearl Harbor, most rubber came from trees in the Pacific isles and was made into tires, tubes and a thousand other products in great American factories. Now, things are different. Rubber still grows in trees in far-away places, but thanks to the ingenuity, resourcefulness and patriotism of the Petroleum Industry, America's great rubber factories will soon be making tires, tubes and a thousand other products from a new kind of rubber—synthetic rubber made from crude oil. And in many respects the substitute will be the superior product.

Because it has always kept abreast of the continuous scientific and economic advancement of the oil industry, the National Bank of Tulsa has been privileged to serve the petroleum industry.

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# Front Lines in REFINING

*by Arch L. Foster*

## Reinforcements for Lubricants

MUCH pertinent discussion and much careful thought are being devoted to the matter of what will be the properties and composition of the aviation fuel in common use after the war. Comparatively little attention appears to be directed, now, by the oil or the aviation-engine industry toward the nature of the lubricating oil which must be that fuel's running mate in peacetime engines. With the excessive overloads, especially on military equipment, it is reported that 1 gal. of oil is consumed for each 20 gal. of fuel, whereas before the war 1 gal. of oil for each 50 gal. of fuel was the typical consumption ratio.

Obviously — although details are masked behind censorship's veil—the engine designed for and using our superfuels develop such extremes of bearing pressures, temperatures, and oxidation - decomposition conditions that oils as we have known and used them in past simply cannot stand the gaff. Very possibly we must plan and expect to use much greater quantities of oil in the future.

It also seems obvious that we must learn far more of the nature of lubrication and of lubricants than we now know. Two phases of this investigation must be explored farther afield; the natural laws which control petroleum's ability to interpose an oil film between rubbing surfaces; the stability necessary in the oil itself and how to improve that stability. Avoidance of corrosion effects on engine parts may be taken as a third phase.

Mineral hydrocarbons have inherent properties of stability, oiliness, etc. These may be injured by molecular changes effected during refining or use, but they cannot be changed except by molecular alteration. We have not found dependable ways to accomplish these molecular changes as a practicable commercial proposition, although we have worked out good methods for removing undesirable materials. The best routes open to us now are those by which products are added to increase oil's film-maintaining ability; also, the same or other products are added which strongly reinforce oil's natural ability to withstand destruction and decomposition. Our greatest efforts now are in applying complex organic and metallo-organic compounds for these two purposes.

## Rapid Units for Quick Butadiene

WHILE a number of untoward occurrences which have militated against the full realization of the potential advantages of the "quick" butadiene program, have not yet been explained satisfactorily we had opportunity recently to see the results of a determined company policy in getting such a unit in operation. At this stage of our synthetic rubber program even 6,800 annual tons of butadiene is not to be sneezed at.

This unit is at Baton Rouge, in a relatively old refinery, with considerable amounts of used, semiscrap material about. Starting on the "quick" butadiene program, a number of old units were dismantled; towers, heaters, refractories, old, pumps, lines, etc., were dragged to a predetermined spot. Old foundations were used in a few cases. Much of the steel in the old units was actually scrap and served to swell the output of scrap iron from this plant. All these pieces of usable equipment were connected together by used pipe and tubing. When they go through that part of it the only new equipment other than a few nipples, elbows, pieces of electric wiring, etc., that had to be added were a number of new or reconditioned compressors — which were fortunately obtainable.

Following a mathematical axiom, that of the whole being greater than any of its parts; conversely its stands to reason that to supply a part of the equipment for a given capacity requires less time than to supply the whole mass of equipment. Whether the cancellations of units similar to the one referred to herein was due to failure on the part of oil companies, to shortage of priorities, or to other possibly unavoidable causes, we do not know.

## A New Name for Octanes?

AWAY back in the late 1920's, Graham Edgar, holding a Ph.D. and some amazingly advanced ideas, opined that such fuel quality "yardsticks" as HUCR (highest useful compression ratio), B.E. (benzol equivalent) and others then used were too inaccurate and indefinite to measure the antidetonation property of motor fuels. He proposed a new scheme; chemically pure isooctane, or 2,2,4-methyl pentane as the chemists express it, was to be chosen as the top of the scale or 100, normal heptane was to be the zero value in antiknock quality; fuels were to be rated by the amount of isooctane required in normal heptane to match their performance. We've been grading motor fuels by this good scale ever since. The production of essentially synthetic aviation and motor fuels has resulted in fuels with better performance properties than the top of the old scale. The maximum rating of isooctane by definition is 100. We often nowadays hear men on the street, even technologists roll glibly under their tongues such expressions as "125 octane number," even "150 octane number." It is a fact that there can be no such animal; no standard scale exists which can enable us to rate a fuel having better antiknock than isooctane.

Qualified technologists avoid the anomaly by rating these better fuels in terms of isooctane plus certain added amounts of tetraethyl lead, as, for example, "isooctane plus 1.07 cc. TEL." This makeshift, however, admits that the old, formerly so useful rule for measurement has become inadequate. Leaders admit we should soon build another more adaptable, less limited method of rating.

What that method may be is problematical; doubtless little if any work will be done until after the war is won. At first glance a plan similar to the octane scale, with some hydrocarbons such as triptane, or an organic compound such as ethyl alcohol, isopropyl benzene or some other with very high antiknock properties as the upper standard of quality, might be adopted.

In addition to antiknock quality as we have known it we have now other considerations to reconcile in a standard test; so-called "rich mixture" performance, the effect of aromatic hydrocarbons, alcohols, hydroaromatic and other inflammable materials, of new revolutionary developments in engines, all complicate a problem long since recognized as one of our most complicated.

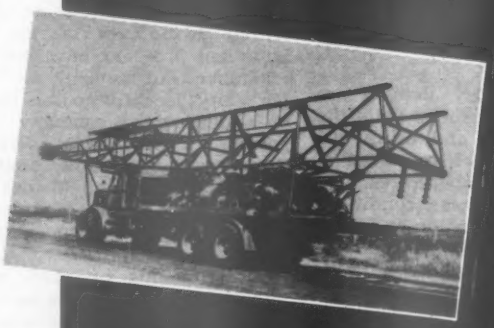
# Be Positive...

## BY LOOKING AT THE INSIDE OF YOUR PROSPECT

In Oklahoma where many prospecting crews have gone back into areas considered exhausted of possibilities, new fields are being found. In Okfuskee County, South Castle Pool was only a prospect in 1940. A detailed seismic survey located an anticline of small area.

There was no question about the presence of the structure. It was there. The question was: Was there oil in the structure? The test by "slim-hole" rig was positive. There was oil, and so, another new field was opened in late 1941 as a direct result of a "strat" test.

Hunton lime flowed 900 barrels daily from 3890 feet on official test! Two additional wells have since been drilled with other locations considered proven. Discovery well was Heffner 1, SE NW NW 17-11-9E, which obtained a show in Cromwell, tested Wilcox and was plugged back to produce 43 gravity crude from Hunton lime after treating with acid.



As a partner with another means of exploration, this "strat" test was the final proof; the POSITIVE PROOF for the known structural condition. There is no structure too small; no structure too complex; no structure too large for the "strat" drill. And there is no better way, dollar for dollar, to "look inside" a structure.

Franks' truck mounted "slim-hole" portable rotary drilling rig (one of which is shown at right in both operating and over-the-road position) is perfect for "strat" tests. It is the most economical rig on the market because it saves rig up and tear down time being completely portable; drills as fast from location to location as the bigger rigs; and saves many extra trucks, tires, water, and fuel.

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*Engineering Fundamentals* No. 92

A WEEKLY FEATURE OF THE OIL AND GAS JOURNAL

# FLOWING-PRESSURE GRADIENTS

FLOWING-PRESSURE gradients are determined in a manner very similar to that by which static-pressure gradients* are obtained. The only essential difference is in the fact that the well is flowing when the flowing-pressure gradient is taken. The principal uses for flowing gradients are enumerated below:

1. Measurement of pressure loss in flow strings. Such measurements are particularly of value for use in deciding at what bottom-hole pressure a well will be expected to stop flowing naturally, and thus require artificial lifting equipment for production of the oil.

2. Data regarding the pressure loss in various sizes of tubing, along with various rates of production, gas-oil ratios and surface pressures are of considerable value in properly designing and operating a gas-lift installation.

3. A flowing-pressure gradient furnishes data that is used in many fields in connection with the taking of potential tests as a part of the allocation program.

Information reported by McAllister† concerning the Kettleman Hills field in California gives a good demonstration of how flowing-pressure gradients may be used. The data given in the following examples are taken principally from McAllister's paper. They are not presented necessarily as exactly duplicating his data, but merely for illustrative purposes.

### Example

A static-pressure gradient was taken on a well and the results of this measurement are shown by Curve A of Fig. 1. The well was flowed through tubing at a rate of 2,523 bbl./day and a pressure traverse was run in the tubing while the well was flowing at this rate. The results of this flowing gradient are plotted as Curve B in Fig. 1. The well was then flowed through casing at a rate of 4,333 bbl./day and the flowing gradient obtained at this rate is represented by Curve C of Fig. 1. As indicated by the points at which Curves A, B, and C of Fig. 1 intersect the pressure axis, the static pressure at the well head was 1,530 lb./in.², the tubing-head pressure when flowing through the tubing was 350 lb./in.², and the casing-head pressure when flowing through the casing was 280 lb./in.²

The midpoint of the producing zone of this well was used as a datum to which all pressure measurements were referred. This point was at a depth of 7,200 ft. It can be seen from Curve A of Fig. 1 that the static bottom-hole pressure at this datum was 2,125 lb./in.² It can be seen from Curve B of Fig. 1 that the pressure at datum when flowing at a rate of 2,523 bbl. per day was 1,420 lb./in.² From Curve C it is evident that when flowing at a rate of 4,333 bbl./day, the pressure at datum was 865 lb./in.²

### Productivity Index

Thus if for each of these two rates of flow the difference between static bottom-hole pressure and flowing bottom-hole pressure is divided by the production rate, a productivity index* is obtained.

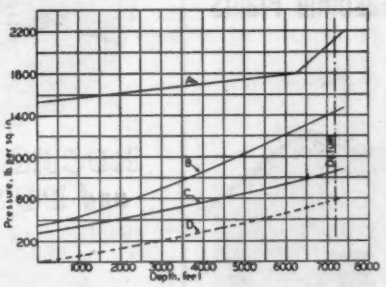


*Fig. 1*

Based on the flow test through tubing, the productivity index is

$$\frac{2{,}523}{2{,}125-1{,}420}$$

, or 3.58 bbl./day/lb./in.² drop in pressure.

Based on the flow test through the casing, the productivity index is

$$\frac{4{,}333}{2{,}125-865}$$

, or 3.44 bbl./day/lb./in. drop in pressure.

In this particular field the potential of the well is arbitrarily defined as the product of the productivity index and the maximum mean-pressure drawdown. The maximum mean-pressure drawdown is defined as the mean-pressure difference at the midpoint of the producing interval between static pressure and the minimum-flow pressure that could be obtained at that point. Theoretically this minimum-flow pressure at the sand face would exist if and when the surface pressure on the flow string were atmospheric.

So for this well the maximum potential was estimated, without actually flowing the well at that rate, by assuming that the flowing-pressure gradient for the well at such maximum rate would be the same as that actually obtained when well was flowed at its highest demonstrated rate of 4,333 bbl./day. This would be equivalent to moving Curve C down to begin at zero surface pressure as represented by the dotted Curve D in Fig. 1; or it is equivalent to saying that the flowing pressure at the datum for the theoretical maximum rate is 280 lb./in.² less than the flowing pressure at datum for the highest demonstrated rate of 4,333 bbl./day. Thus, the datum flowing pressure for the theoretical maximum rate on this well is 865-280, or 585 lb./in.²

Thus the maximum potential for the well, determined according to the established rule described above, is 3.44(2,125—585), or 5,296 bbl./day.

It is well known that rules for determining potentials for allocation purposes are considerably varied in their nature from state to state and even from field to field within a state. Many of these variations are justified because of the difference in pool and well conditions for different fields. At any rate the procedure outlined above may not be of wide practical application because of difference in the rules set up for various fields. However, this is a concrete example of a logical way in which subsurface flowing pressures are applied in connection with the proration of oil production.

*See Installment 90.

†E. W. McAllister—"Development and Application of Subsurface-Pressure Data in Kettleman Hills," Pet. Dev. and Tech., A.I.M.E., 1941.

*See Installment 87.

Series prepared by Glenn M. Stearns, associate professor of petroleum engineering, University of Oklahoma

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Borg Warner Corporation
1306 Eighteenth Ave., Rockford, Illinois.

# CONTROL OF PUMP REPAIR COSTS

SEVERAL companies maintain a well trouble cost-accounting system. The monthly operating cost of all major items of individual well operating expense is available for any given period of time. Individual well expense is followed quite closely, and these companies are reasonably successful in holding such items of operating cost at a minimum figure.

**Procedure.**—When the expense of any phase of well operation increases over a sufficient period of time to indicate that it might be permanent, cost data pertaining to that particular item of expense are referred to the engineer in charge. His job is to analyze all operating data and make whatever investigation appears necessary in order to develop ideas for reducing the trouble.

The remedial action which may be taken to control excessive pump trouble is shown below:

1. Change in type or make of pump.
2. Care in starting to pump after well-servicing operation.
3. Elimination of sand: (a) By cleaning out. (b) By sand filter or trap.
4. Elimination of gas pound.
5. Increase in pump efficiency: (a) Through change in pump bore. (b) Through change in cycle.

Whether justifiable or not, a change in type or make of pump is the most frequent procedure followed in attempts to reduce pump cost. The steps taken by the pump engineer, in organizations where operating costs are available in detail, begin with an analysis of a well repair expense sheet. The engineering clerk very often is responsible for spotting wells where expense trend on any one item appear to be premanently out of line. When these come up for action, the following data are transmitted by memorandum to the pump engineer.

The information shown under reason has been briefed for space convenience. However, when this data sheet is referred to the pump engineer, the reason for pump failure, together with the type and make of pump is shown in the detail necessary for an exhaustive investigation. The recommended pump change was made on June 1 and the subsequent expense was posted for the engineer through to the end of the year in order to follow the results.

**Analysis of expense trend.**—In logical sequence, the first step usually taken by the subsurface engineer is to obtain a chart conception of cost trend, as shown in Fig. 1.

Fig. 1 brings out a definite upward trend of pump repair cost which threatens to establish a much higher level of operating expense. The change in pump, however, held the cost at the same level established during the past 3 years. The upper broken line is an estimate of what the pump repair cost would have been if action had not been taken, and the lower broken line is an estimate of the 1942 expense if the pump change had been made at the beginning of the year.

### Inspection of Operating Data

**Production curve.**—In this particular case the upward trend in pump cost, which started in 1937 and continued until 1939, was investigated for the purpose of finding out if the increase at that time might give any clue as to the reason for the present upward cost trend. A inspection of the oil and water production curves indicated that a gradual increase of water occurred over the period in which pump repair cost increased. This necessitated an increase in the pumping cycle and appeared responsible for the upward cost trend. The information assembled, therefore, indicated that the current increase in pump cost was not due to a change in fluid volume handled or to a change in pumping cycle.

The next step was to examine the reasons for all pump failures as shown on the well repair expense sheet. In the table, inasmuch as much of the detail was omitted, the fact that corrosion might be responsible for the pump trouble is obvious. After this lead was established a detail of the pump repairs for the year 1941 was requested. It was found that pitted or corroded tubes were mentioned only in the last pump job which occurred during the year.

Rod trouble expense is also readily available where cost-accounting systems are maintained, and the next step involved a study of rod breaks. It was found that rod trouble had increased, although not to an excessive stage.

With corrosion established as a rather definite possibility for the increase in pump trouble, a recommendation was made for the installation of a noncorrosive alloy pump.

### Discussion

In this particular example showing procedure followed by an investigat-

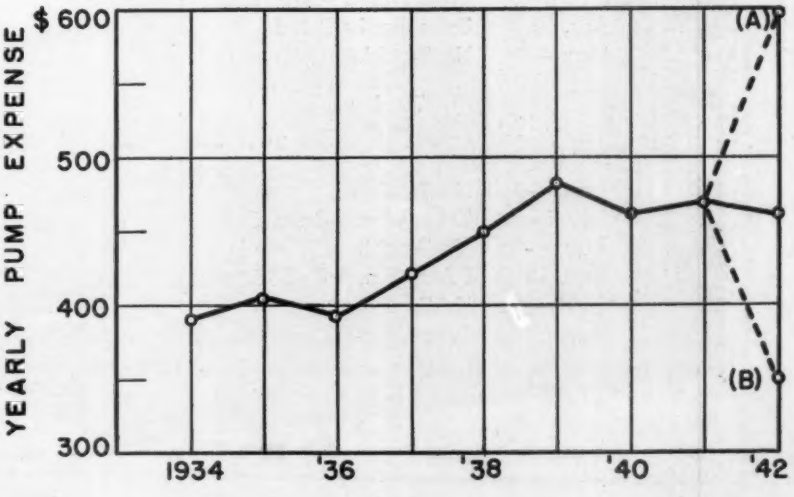


*Fig. 1*

ing engineer, the recommendation involved a change of pumps. The fact that corrosion was responsible for the trouble was so obvious that the detailed path of investigation, which is usually necessary, was not followed. Frequent reports showing corroded pump parts was a definite lead to begin with; and, as it so happened, the final substantiating evidence reflected by rod trouble eliminated the necessity of further study.

It should be pointed out that the corrosiveness of the well fluid became more pronounced at the first of 1942, without an increase of the water itself. While this does not occur frequently, it has occurred often enough so that most field engineers recognize the possibility and accept such indications in making their final analysis.

# WELL REPAIR EXPENSE

| Surface | Subsurface |
|---|---|
| Rig Front | Pump |
| Derrick | Sucker Rods |
| Engine | Tubing |
| Miscellaneous | Miscellaneous |

| Year | Total expense |
|---|---|
| 1934 | $472 |
| 1935 | 405 |
| 1936 | 397 |
| 1937 | 422 |
| 1938 | 450 |
| 1939 | 482 |
| 1940 | 465 |
| 1941 | 470 |

| 1942 | Reason | Expense per month |
|---|---|---|
| Jan. 12 | Tube Pitted—B&S replaced | $48 |
| Feb. 17 | Split Tube—Corroded | 56 |
| Mar. 10 | Tube Scored—Sanded Up | 45 |
| Mar. 13 | Tube Pulled—B&S replaced | 47 |
| Apr. 19 | Tube Badly Pitted | 52 |
| May — | No Trouble | |
| | Total | $248 |
| | For year 248/5 times 12 equals $595 | |
| June — | No Trouble | |
| July 5 | Tube Worn—Sand Cut | $45 |
| Aug. — | No Trouble | |
| Sept. 10 | Pump Sanded—B&S | 58 |
| Oct. — | No Trouble | |
| Nov. 6 | Tube Worn—Cage Broken | 49 |
| Dec. 30 | Pump Sanded—Holddown Stripped | 52 |
| | Total | $204 |
| | For year $204/7 times 12 equals $350 | |

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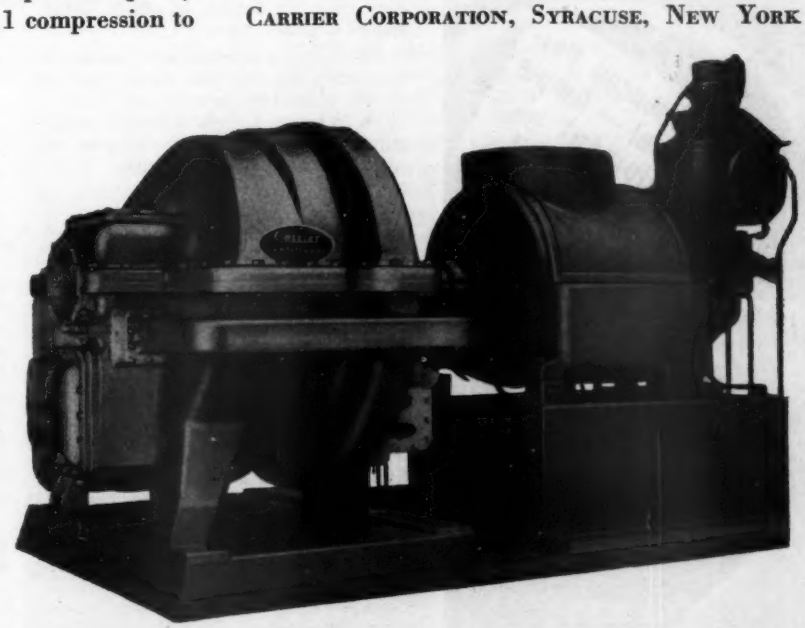

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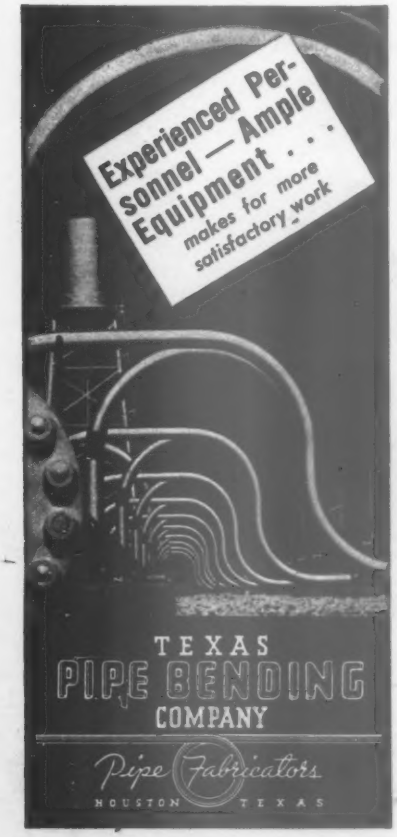


# REFINING

## Production to Start Soon At Pittsburgh Rubber Plant

PITTSBURGH, Pa.—Production of butadiene at Koppers United Co.'s new synthetic-rubber plant near here will start late this month, it was announced last week by Dan M. Rugg, vice president of Koppers in charge of the butadiene project.

Production of styrene will follow shortly after completion of the butadiene unit, Mr. Rugg said. Both products will be shipped to Akron, Ohio, for coplymerization.

## Security Clause Ordered In Shell-A.F.L. Contract

WASHINGTON, D. C. — A union-security clause last week was ordered included in the contract of Shell Oil Co., Inc.'s refinery at Wood River, Ill., with the A.F.L. metal trades department. The ruling was made by a majority of the War Labor Board over protests of the industry board members that the action, in effect, established a closed shop.

The board also adopted a panel recommendation that the work schedule of the plant be increased to 40 hours from 36 hours a week with the understanding that no employe will be laid off as a result of the change.

The majority opinion, written by Dr. Frank Peter Graham, public member, held that the grant of the union-security clause to the union, which already had a preferential hiring clause, was on "most special grounds and is not to be taken as a precedent."

## Shell's Houston Refinery Resumes Operations

HOUSTON, Tex. — Operation of Shell Oil Co., Inc.'s Deer Park refinery, near Houston, was resumed June 13 after a 48-hour suspension of processing because approximately 1,200 employes refused to report for duty. The walkout resulted from discharge of an employe in the treating plant who had an altercation with the superintendent of the department. Workers demanded release of the superintendent, unless the company reinstated the discharged employe.

The Oil Workers Union, represented at the plant by Local 367, disclaimed any part in the strike. Members and nonmembers alike took part in the walkout.

Agreement was reached late June 12 to submit the dispute to arbitration. The company and a committee representing the employes agreed to accept findings of the arbitration committee.

Without taking sides in the dispute, Petroleum Administrator Ickes insisted, in telegrams to Dr. H. R. Waser, general manager of the refinery and to E. C. Mattern, international representative of the Oil Workers Union, that they cooperate with the U. S. Conciliation Service and return the plant to production.

Alexander Frazer, New York, president of Shell, declared that the strike immobilized 1,750 employes, that about 1,200 were off the job and that the suspension of work was instigated by about 400 workers.

J. F. M. Taylor, New York, Shell vice president in charge of manufacturing, said that the daily gasoline supply of 1,000 bombers was lost through the shutdown.

## Butadiene Study to Be Made At Bureau of Mines Station

WASHINGTON, D. C.—Possibilities of direct conversion of butane to butadiene as an aid to the economic manufacture of synthetic rubber will be the initial project assigned to a new laboratory at the Bureau of Mines petroleum experiment station at Bartlesville, Okla.

This disclosure was made here last week when Dr. R. P. Sayres, director of the bureau, announced appointment of Dr. Hugh M. Huffman, formerly of the California Institute of Technology at Pasadena, to direct the operations of the new Bartlesville laboratory. The general function of the laboratory will be the determination of the thermodynamic properties of hydrocarbons and their derivatives.

Dr. Huffman, an outstanding authority on physical chemistry and thermodynamics, will be assisted by a staff of physical chemists. A native of California, Dr. Huffman was educated at Stanford University where he earned the degree of doctor of philosophy in 1928. He was an American Petroleum Institute research associate at Stanford from 1927 to 1931 and has been assistant professor of biochemistry at California Tech since 1931. He is the author of nu-

merous articles and coauthor with Prof. George S. Parks of Stanford of an American Chemical Society monograph, "Free Energies of Some Organic Compounds."

Thermodynamic studies enable the physical chemist to determine the most favorable conditions of pressure and temperature for a given reaction in a manufacturing process, Dr. Sayers explained, and to state definitely the maximum yields that may be expected when a catalyst is used to accelerate the reaction.

Lacking thermodynamic data for processes used in the manufacture of aviation gasoline, toluene, and butadiene, petroleum refiners have been compelled to develop these processes by empirical or trial-and-error methods. Precise thermodynamic data will be used to evaluate the efficiency of processes now in use and to suggest changes in operating conditions where needed. Even more important to processes yet to be developed, these data will make it possible to design plants to operate under the most favorable conditions that can be realized in practice.

## Oleum Refinery Fire Causes Slight Damage

LOS ANGELES, Calif.—Fire which originated in the lube agitator June 12 destroyed two 700-bbl. storage tanks and attached equipment at Union Oil Co. of California's Oleum, Calif., refinery. The blaze was brought under control in 5 hours.

## Full PAW Authority Over Refining Given Cumming

WASHINGTON, D. C.—Further decentralization of authority within the Petroleum Administration for War has been accomplished through an order issued by Ralph K. Davies, deputy administrator, delegating to E. D. Cumming, director of refining, full authority to regulate the manufacturing branch of the industry.

Under this delegation Mr. Cumming has authority to issue necessary operating directives, by telegraph or otherwise, to refiners in any district specifying the character and extent of their operations, including quantity of crude runs and nature of products, in conformity with general policies of PAW. Such delegation of authority is permitted by the executive order creating PAW. This action is expected to result in closer relations between PAW and the refining industry and to speed up PAW actions, since refining details will no longer have to be handled personally by Mr. Davies. All appeals and applications for exceptions are to be handled directly by Mr. Cumming.

## Adams Made Chief ODT's Chicago Tank-Car Service

WASHINGTON, D. C.—Appointment of Arthur A. Adams, formerly a transportation specialist for the War Production Board and the War Department, as Chicago regional manager of the section of Tank-Car Service of the Office of Defense Transportation's Division of Petroleum and Other Liquid Transport, was announced last week.

Mr. Adams will be responsible for the issuance of ODT permits for all tank-car movements of 200 miles or less in the region composed of Illinois, Indiana, Michigan, Wisconsin, Minnesota and Iowa.

Approximately a fourth of all ODT permits for short-haul tank-car movements, issued under the agency's program for the diversion of all hauls of 200 miles or less to tank trucks, cover shipments in the Chicago region.

The office, located at 209 South Wells Street in Chicago, has been under the temporary supervision of Arthur E. Carlson of the section's Washington, D. C., staff since April.


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# PIPE LINES

## Floods Continue to Impede WEP Operations

High water in the East Texas field is interfering with oil-field operations sufficiently to slow down deliveries of crude from that area to the War Emergency Pipelines, Inc., terminal at Longview, Tex. Floods in the vicinity of Gale, Ill., have broken levees. As a result, the Gale station of WEP has been filled with water. Completion of the 16-in. line from the Gale station to the nearby loading rack of Allied Terminal Co. has been hindered. Shortly after water recedes, the small amount of work remaining to be done on this line will be finished and the Allied facilities will be in a position to function for transshipping crude by tank cars. Arrangements for the Allied terminal were made in order to avoid possible congestion at the Norris City, Ill., terminal of WEP. So far there has been no congestion at Norris City.

For more than a month Cities Service Oil Co. interests have been loading about 108 cars daily with WEP crude oil reaching a loading rack at Benton, Ill., via the Ohio Pipe Line Co. system from Norris City.

Water has gone down so as to clear the New York Central Railroad tracks north of Norris City between Mount Carmel and Lawrenceville, Ill. Tank cars which were scattered during the bad flood conditions are reported to be returning to Norris City at a satisfactory rate and rail shipments from there have been increasing. Loadings over last week end were as follows: June 12, 900 cars; June 13, 675 cars.

Tanks at the Longview terminal are reported to be about half filled with heating oil and West Texas crude. It is expected that the first shipment of West Texas crude will be sent through the 24-in. line to Norris City some time this month. Heating oil is to go through at the head of the stream after the big-inch has been completed all the way to the East Coast.

Up to the night of June 13, construction progress on the two WEP lines was as follows: Eastern extension of the big-inch crude-oil line, 567 miles of 24-in. and 113 miles of 20-in., making a total of 680 miles; refined products line, 152 miles of 20-in. The work has been hindered by much rain. In the Poplar Bluffs, Mo., sector there has been rain for 52 days.

Preparations are being made for repairing the broken 24-in. line across the Arkansas River near Little Rock, Ark.

## West Texas-St. Louis Outlet Urged by District 2 Interests

Reports the first of the week indicated that investigations now under way may result in changes in the 383-mile 16-in. pipe line from Sundown, Tex., to Drumright, Okla., a project of the Stanolind Pipe Line Co. (Standard of Indiana) approved early in the month by the War Production Board. The new line which will obtain its crude-oil supplies from the Slaughter field and other West Texas areas (see The Oil and Gas Journal, June 10, p. 80) will have an initial capacity when it is completed in March 1944 of 54,000 bbl. daily. The line's capacity, by installation of additional pumping facilities, can be at least doubled.

It has been contended by some that the diameter of the line should be increased to 18 or 20 in. which would mean that the maximum capacity would be expanded to either 175,000 or around 235,000 bbl. daily. Support for the larger line is based on the belief that the additional crude oil from West Texas will be needed early next year due to the decreasing crude-oil output in District 2 (Middle West and upper Mid-Continent) a trend which has been under way for some time.

It has been urged by some that the 16-in. line or whatever size is finally approved, be extended directly to St. Louis or a smaller line built from Drumright to St. Louis. The crude at that point would be tendered to existing lines next year which, it is claimed, will not be receiving normal quantities of crude oil from Oklahoma and Kansas connections because of the reduced production of the two states. The additional crude oil, it is felt, will also be needed to offset the decreasing supplies from the Illinois basin area. It is also pointed out that, should it be necessary, the St. Louis terminal would be a convenient point for the movement of crude oil by rail to refineries in the Middle West and East.

It has been assumed that the facilities of the 16-in. line as originally

projected by the Stanolind company and as now approved by WPB will be used by companies other than the Standard of Indiana units. Any crude oil brought from West Texas to Drumright can be made available in Oklahoma to several systems connected to refineries in the Mid-Continent, Middle West and East.

It is understood that committees representing District 2 transporters and suppliers have been investigating the possibilities of the line in relation to refinery requirements in that area next year and these committees will shortly make recommendations to PAW involving possible changes in the present plan of operations.

## Sinclair Prepares for Chicago-Toledo Project

Sinclair Refining Co. is making preliminary arrangements for the laying of an 8-in. products line from Chicago, Ill., to Toledo, Ohio, according to reports. However, at the beginning of this week there had been no announcement of a federal permit for the project.

In the vicinity of Gordon, Kans., it is said that about 75 miles of 8-in. will be taken up by O. C. Whitaker Co. for the new line. It is understood that the line will be laid by Exeter Construction Co. Some preparations have been made for storing pipe at Maumee, south of Toledo, Ohio.

An engineering subcommittee has been investigating the effect of the proposed line on the transportation situation in terms of Great Lakes tanker capacity which might become available for service on other routes which are important for the war program.

Sinclair has started a 3-in. pipe line from the Sinclair Clear Fork station near Eliasville, Stephens County, Texas, to the Murray field, in southwest Young County. The line will be about 12 miles long.

## Standard of Louisiana Lays Line to Golden Meadow, La.

A main line and two laterals are nearing completion for Standard Oil Co. of Louisiana to connect the company's Baton Rouge, La., refinery with the Golden Meadow, La., area. The project consists of approximately 132 miles of pipe of various sizes. From the Baton Rouge-Anchorage area 14 miles of 10-in. extend to the Choctaw field; from there to the Raceland field there are 66 miles of 8-in.; the remainder of the line to Golden Meadow consists of 28 miles of 6-in. Two spurs, totaling 24 miles of 4-in., connect Golden Meadow with the Delta Farms and Bayou Allemand pools. In connection with this undertaking a 4-in. line from the Baton Rouge-Anchorage area to a point near the Choctaw field is being taken up.

Pipe has been removed from loops on the main line from Moore station to Baton Rouge to provide 8-in. pipe for the new Golden Meadow project. At three locations near Moore, Oxford and Flora stations, six loops, each consisting of 3⅝ miles of 8-in. have been removed and replaced with two loops of 12-in. at each of three locations.

The company has recently removed 14 miles of 12-in. and 16½ miles of 8-in. from a line between Haynesville, La., and El Dorado, Ark.

## Southwest Emergency Line Requires Reconditioning

Owing to the large number of leaks discovered when the converted, coupled natural-gas line of Southwest Emergency Pipe Line, Inc., was tested for moving sweet crude from the Corpus Christi, Tex., area to Houston refinery connections, it is reported that the project will require reconditioning and the welding of all joints. This work would take most of the summer.

This system was scheduled to make substantial deliveries in June which would contribute to easing the supply situation in the program for feeding the War Emergency Pipelines, Inc., 24-in. line.

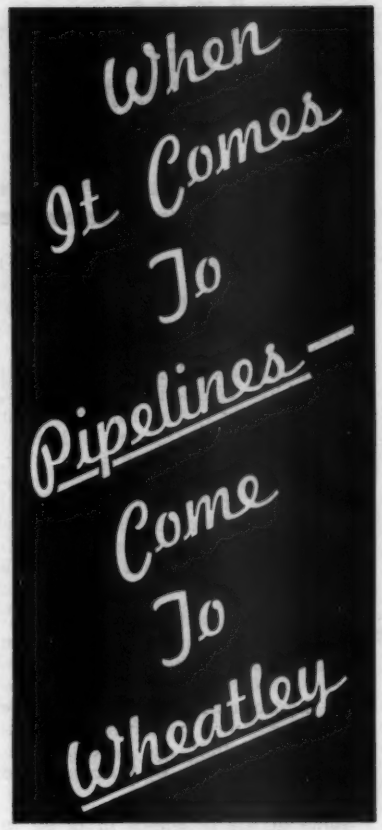
## Cities Service Schedules Deliveries of Pipe

Pipe for the 240-mile 26-in. natural-gas line to be built by Cities Service Transportation & Chemical Co. from the Hugoton field to Blackwell, Okla., is to be delivered from A. O. Smith Corp., according to the following schedule: 15,000 tons in September; 22,000 to 25,000 tons in October and the balance of the 46,000 tons in November. The pipe is to be made of high tensile steel, 1.5 per cent magnesium; 52,000-53,000 lb. transverse yield; 60,000 lb. longitudinal yield.

## Board Approves Overtime Pay for Northern Group

WASHINGTON D. C.—The National War Labor Board last week approved a request by three crude-oil trunk-line operating companies, the Buckeye Pipe Line Co., the New York Transit Co., Inc., and the Northern Pipe Line Co., to pay time and a half for overtime in excess of 40 hours worked by their approximately 700 field employes.

The three companies operate under common management and own an oil trunk line extending from Griffith, Ind., to Buffalo, N. Y.

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# Natural Gasoline

## Plant Operators Have Stake in Conservation

The trend toward compulsory utilization of hydrocarbons in natural gas, brought clearly to the front in recent actions of the Petroleum Administration for War, is hastening the day, natural-gasoline manufacturers contend, when production of new oil wells will be prohibited until adequate preparations are made for conservation of gas withdrawn in the operation.

These trends, actually in subjugation both of oil and gas production to the ultimate goal of maximum recovery and utilization of the two related hydrocarbons, where they are found in common reservoirs or in intimate association, are receiving increasing recognition by operators and engineers.

Some of the problems involved in the conservation of gas and a prediction of how operations will be regulated in the future were recently enunciated by H. W. Harts, vice president for gasoline manufacturing of Warren Petroleum Corp. In an address before a Tulsa engineering group, he said in part:

"Since the Government is continually assuming more and more control of the production of oil; and, since the recent trend has been continually toward conservation in general, and pressure maintenance in particular, it is extremely possible (and even probable) that within the near future no new oil production will be permitted without first making preparation for the utilization and conservation of all gas produced in conjunction with the production of oil.

"The reporting and control of oil-gas ratios, the studying of South American practices and the record of both increased production and reserves, due to repressuring and pressure maintenance, are all facts that are indicative of the trend toward regulation of reservoir pressure and the prevention of the wastage of gas.

"The changing conditions in operation have caused the natural-gasoline manufacturer to assume a different roll in that the various producers look to the plant operator to coordinate all of the various interests and to arrange a satisfactory plan between them for the entire repressuring set-up. The plant operator, even priod to the construction of the plant, will contact each producer in the area and arrange with him a suitable plan for the successful culmination of the conservation effort. He will then construct his plant and lay the necessary high-pressure return lines to the various leases and wells which have been previously designated by the owners of the lease. He will install meters, dehydrate the gas and deliver it to the location of the input well. The producers, in the meantime, will have arranged a repressuring association among themselves and will have appointed a committee to be responsible for the actual injection of the gas into the wells. This committee, in turn, will hire a petroleum engineer who will be employed, not by the repressuring plant but by the various producers and it will be his duties to make a just and fair distribution of the returnable gas to various wells used for the maintaining of the reserve pressure. This engineer actually acts as a coordinator between the gasoline operator and the various lease operators and also is responsible, to a large extent, for the success of the venture.

"In many instances, the entire repressuring program may cost as much as $2,500,000, of which a fair proportion pertains entirely to the producing companies and from which the natural-gasoline manufacturer derives no benefit. For this reason, it would obviously be impossible for the plant owner to stand the entire expenditure. At this point, the cooperative pooling of properties commences and a mutual agreement is entered into between the natural-gasoline manufacturer and the producer whereby each producer will stand his pro rata share of a portion of the necessary expenditures. There are several ways that this mutual pooling can be worked out but one of the simplest is to have the gasoline plant operator own and pay for all of the equipment, normally necessary for the production of the various products made in the natural-gasoline plant, and all extra expenditures and equipment necessary for repressuring to be divided equally among the leaseholders. Each producer, after paying his pro rata share, will, in turn, own certain equipment which would revert to him at such time as the repressuring program and the production of oil ceased, but would necessarily be entirely under the jurisdiction of the plant operator while the program was in existence. This procedure not only tends to equalize the necessary cost of the project, but also tends to increase the interest of each operator in the repressuring program, inasmuch as he owns a certain amount of the equipment necessary for the successful culmination of the plan. Cooperative deals, similar to this, have been worked out in various places in the Mid-Continent area and more recently in Illinois; and, as yet, have all been successful, even above the original expectations of the participants.

# Natural Gas

## Arkansas-Louisiana Purchases Company

LITTLE ROCK, Ark.—The Arkansas Utilities Commission last week authorized Arkansas - Louisiana Gas Co., Shreveport, La., to purchase the Consumers Gas Co., at Hot Springs, Ark., for $800,000.

Arkansas-Louisiana spokesmen said the company had contracted to take over Consumers' $424,000 outstanding bonds and $300,000 common stock from the Central Arkansas Public Service Co., a holding concern, and planned to dissolve the corporate existence of the Consumers Gas Co.

## Louisiana Continues Fight on Tennessee Line

WASHINGTON, D. C.—Opposition of the Louisiana Public Service Commission was continued last week to the natural-gas pipe-line project of the Tennessee Gas & Transmission Co.

P. A. Frye, secretary of the Louisiana commission, appearing before a Federal Power Commission examiner considering the company's application, said that the proposal was nothing more than a speculative venture and that it was backed by "nothing more substantial than hope."

The state's opposition is based chiefly on the policy of retaining natural resources within its boundaries and, thus, force consumers engaged in manufacturing to relocate their plants in Louisiana.

Tennessee Gas & Transmission Co. proposes to build a line from the South Louisiana fields to Ashland, Ky., and Kenova, W. Va., asserting that it would mitigate the fuel shortage in industrial sections of the eastern states. Eventually, the line would be extended farther north but probably not until the war is concluded.

# Exploration and Drilling

## Week's Highlights

FINDING of oil in the Simpson on the west flank of the Yates high loses none of its importance because of the fact that it could almost have been predicted. Lower Ordovician production has now been found at a number of scattered localities on the north and east flank of the Fort Stockton high from its eastern extremity in Pecos County to the New Mexico border.

From the standpoint of maintaining the nation's production over the next few years, the potentialities of these deep pays in West Texas provide an antidote of no mean value to the pessimism that has been expressed in many quarters. The fact that most of the areas in which Ordovician production has been found also contain Permian oil reservoirs will make orderly development of the deep pays possible, since this production will keep the leases in force without the necessity of offsetting wells in the deep pays before the market is ready to absorb it.

It will also give the engineers time to size up the behavior of wells and the best methods for their economic exploitation before the rush of drilling starts rather than afterwards. The main factor which may upset the apple cart is the fact that the deeper oils are of higher grade than the Permian crudes and will, therefore be easier to sell. This may cause too rapid drilling and, at the same time, hold back Permian production even more than it is now being restricted.

Recently an extension of Delaware sand production into New Mexico has been reported. This is the only Permian production reported so far from the west flank of the Fort Stockton high and extends from central Pecos County into Eddy County, a distance of some 125 miles, more than that in which Ordovician production has been found on the east flank. It is quite possible that this relatively poor production will be found to be underlain by the Ordovician pays, in which case the Ordovician possibilities of the west flank will far outweigh those of the Permian.

Ellenburger production in the Embar field of Andrews County indicates that the Ector County highs may also be important Ordovician producers and Big Lake and Barnhart in Reagan County may forecast important deep developments throughout the whole of the eastern part of the basin. Of these outliers, Barnhart is probably the most interesting as it does not now produce from the Permian. Thus, in this area where prospecting to the possible pays below the anhydrite has been disappointing, there is another deep objective which may pay off.

There is some evidence, therefore, that the Ordovician producing area may be larger than that outlined by the Permian fields and the limits of Permian production have not yet been found. On the other hand, there is no evidence up to the present time that there are not deep possibilities in the Permian fields.

**OKLAHOMA:** Discovery of Hunton oil west of Edmond has started a big lease play along the strike of the new field (p. 112).

**WYOMING:** Tensleep production has been extended in the Elk Basin field (p. 102).

**TEXAS GULF:** Much activity is reported around the margins of the Katy field (p. 107).

**CALIFORNIA:** Several locations have been proved up in the Sentous zone at Inglewood (p. 96).

**SOUTHWEST TEXAS:** A new gas-distillate area has been opened in Live Oak County (p. 105).

### COMPLETIONS IN ALL FIELDS . . .

(Week ended June 12, 1943)

| | Oil | Gas | Dry | Total | Footage | Total comp. to date 1943 | 1942 |
|---|---|---|---|---|---|---|---|
| N. Y., Penn., W. Va. | 53 | 11 | 6 | 70 | 142,454 | 1,433 | 1,583 |
| Ohio | 1 | 12 | 9 | 22 | 48,114 | 364 | 437 |
| Indiana | 1 | 0 | 5 | 6 | 14,186 | 108 | 146 |
| Kentucky | 0 | 4 | 4 | 8 | 20,485 | 141 | 98 |
| Illinois | 10 | 0 | 13 | 23 | 62,251 | 744 | 679 |
| Michigan | 5 | 3 | 6 | 14 | 31,692 | 199 | 298 |
| Kansas | 17 | 0 | 12 | 29 | 100,425 | 671 | 651 |
| Nebraska | 0 | 0 | 0 | 0 | 0 | 12 | 19 |
| Missouri-Iowa | 0 | 0 | 2 | 2 | 2,059 | 7 | 9 |
| Oklahoma | 12 | 3 | 12 | 27 | 103,659 | 478 | 582 |
| Texas: | | | | | | | |
| North Central Texas | 8 | 0 | 12 | 20 | 57,235 | 537 | 545 |
| West Texas | 12 | 0 | 3 | 15 | 74,353 | 365 | 764 |
| Texas Panhandle | 0 | 0 | 0 | 0 | 0 | 76 | 192 |
| Eastern Texas | 4 | 0 | 8 | 12 | 51,393 | 119 | 186 |
| Texas Gulf Coast | 2 | 0 | 3 | 5 | 38,056 | 175 | 369 |
| Southwest Texas | 8 | 0 | 10 | 18 | 83,183 | 383 | 594 |
| Total Texas | 34 | 0 | 36 | 70 | 306,220 | 1,655 | 2,650 |
| North Louisiana | 0 | 0 | 1 | 1 | 2,698 | 130 | 214 |
| Louisiana Gulf Coast | 2 | 0 | 6 | 8 | 40,119 | 154 | 242 |
| Total Louisiana | 2 | 0 | 7 | 9 | 42,817 | 284 | 456 |
| Arkansas | 0 | 0 | 0 | 0 | 0 | 104 | 65 |
| Mississippi and Southeast | 2 | 0 | 2 | 4 | 31,612 | 36 | 26 |
| Montana | 4 | 0 | 1 | 5 | 10,050 | 80 | 70 |
| Wyoming | 0 | 0 | 0 | 0 | 0 | 50 | 40 |
| Colorado, Utah | 0 | 0 | 0 | 0 | 0 | 5 | 4 |
| New Mexico | 6 | 0 | 0 | 6 | 24,221 | 95 | 112 |
| California | 28 | 0 | 4 | 32 | 118,276 | 548 | 351 |
| Total United States | 175 | 33 | 119 | 327 | 1,058,521 | 7,014 | 8,276 |
| Total previous week | 181 | 26 | 127 | 334 | | | |
| Week ended June 13, 1942 | 174 | 39 | 104 | 317 | | | |

# Lithification Processes and Early Oil Formation in Sediments

*by W. V. Howard*

IN a recent article[1] an attempt was made to reconcile a classification of sedimentary rocks according to the environment in which they were deposited with one based on the environments from which the materials composing them were derived. This covered only the materials laid down during the period of transportation and deposition of sediments and did not deal with later processes by means of which they are converted into solid rock. The second stage in the formation of the average reservoir is a secondary process referred to as cementation or lithification.

This is independent of the type of sediment involved whether it is of the normal class and is deposited as well-sorted material on a continental shelf or is of the flysch or molasse type and is deposited more rapidly in deeper basins. Cementation depends on two main factors, the composition of the water in which the sediments are deposited and the rate of deposition. The commonest form of cementing material is calcium carbonate which is carried in solution in the form of bicarbonate.

Clark[2] estimates that 68.4 tons of material are dissolved each year from each square mile of area contributing to the salinity of the ocean. Of this, 20 per cent is in the form of calcium ions and 35 per cent is carbonate ion. The sea with much greater salinity may be considered as nearly saturated with calcium carbonate so that much of the annual increment is precipitated. Part is secreted by animals forming shells and skeletons and on their death this calcium carbonate sinks to the bottom of the sea.

### Cementation

Here there is continual solution of the precipitated calcium carbonate and reprecipitation with the result that the openings between the grains of clastic material become filled or partially filled with calcite. This tends to cement the grains together, making a solid rock.

Obviously, the amount of calcium carbonate brought to the sea varies at different places. Rivers flowing over limestone naturally will bring more in solution than rivers flowing over other rocks. Many streams are high in sulfates rather than carbonates, although they may carry much calcium in solution. Ocean currents mingle these waters and the calcium carbonate deposition tends to become uniform over wide areas.

The quantity of cementing material in the rocks deposited over a period of centuries in one locality may be approximately equal to that deposited later in the same general area but if the quantity of clastics deposited in the two periods differs, the degree of cementation may also differ. If clastics are entirely absent, the resulting rock is a pure limestone.

Much has been written about the places in which limestones are deposited. Actually, deposition of calcium carbonate takes place almost everywhere in the sea and limestone is formed where there are no other sediments deposited along with it. Hence, the greater proportionate quantity of limestone in normal sediments than in flysch sediments and their almost complete absence in molasses.

There is a general feeling that cementation takes a considerable time so that older sediments are more firmly cemented than later ones. It is true that consolidated sediments are uncommon in the Gulf coastal plain area and in the California basins, but this is probably more due to the fact that they are of flysch and molasse types rather than because they are comparatively young.

The writer has seen cementation of sand in a sand bar take place within a decade as was shown by the fact that cocoanut trees which are generally less than 10 years old had been planted on this bar and were being killed by the formation of a solidly cemented bed which pinched off their roots. On the other hand, he has seen in a quarry in Massachusetts a sand of Cambrian age which was probably marine and which had been through more than one period of mountain building yet which was so unconsolidated that it was being dug with hand shovels.

The unconsolidated nature of the Wilcox sand at Oklahoma City is well known and it was probably deposited so rapidly that the calcium carbonate being deposited contemporaneously could not act as more than a slight binding agent.

Actually, as Twenhofel[3] says, "Too little is known as to the causes, times, and methods of cementation. It is a field inviting research."

The same can also be said of the processes of sedimentation. There has been much study of the deposition of recent sediments but the value of this study to the tracing and exploitation of oil reservoirs may be limited

## DAILY AVERAGE PRODUCTION FOR WEEK

| | June 12 crude oil | June PAW quota all oils | June 5 crude oil |
|---|---|---|---|
| Arkansas | 73,785 | 72,800 | 73,015 |
| California | 772,500 | 823,300 | 772,750 |
| Colorado | 5,830 | 7,000 | 5,855 |
| Eastern fields | 100,450 | 111,500 | 101,650 |
| Illinois | 212,850 | 246,200 | 213,600 |
| Indiana | 11,400 | 15,500 | 15,100 |
| Kansas | 305,700 | 300,000 | 271,050 |
| Louisiana | 326,695 | 330,800 | 332,055 |
| *North Louisiana* | *85,845* | ..... | *85,505* |
| *Louisiana Gulf Coast* | *240,850* | ..... | *246,550* |
| Michigan | 61,010 | 58,900 | 57,900 |
| Mississippi | 52,700 | 50,000 | 54,240 |
| Montana | 18,120 | 22,300 | 21,000 |
| Nebraska | 2,150 | 2,400 | 2,150 |
| New Mexico | 101,300 | 105,700 | 101,400 |
| Oklahoma | 334,650 | 373,500 | 328,750 |
| Texas | 1,495,800 | 1,602,000 | 1,499,200 |
| *East Texas* | *334,900* | ..... | *336,200* |
| *West Texas* | *228,950* | ..... | *228,300* |
| *North Central Texas* | *131,800* | ..... | *131,800* |
| *East Central Texas* | *123,500* | ..... | *123,750* |
| *Texas Panhandle* | *90,100* | ..... | *90,400* |
| *Texas Gulf Coast* | *513,700* | ..... | *513,800* |
| *Southwest Texas* | *72,850* | ..... | *74,950* |
| Wyoming | 96,280 | 97,000 | 96,880 |
| Total United States | 3,971,220 | 4,218,900 | 3,946,595 |
| Total production Jan. 1-June 12, 1943 | | 637,535,170 bbl. | |
| Same period last year | | 620,328,435 bbl. | |

unless particular attention is paid to the fact that most of the sediments now being deposited and worked over are of abnormal origin or have been recently subjected to abnormal conditions.

Within a comparatively recent time the crust of a large part of the earth has been subjected to the weight of a thick mass of ice, averaging more than 1 mile in thickness. This ice has pushed and carried rock debris of all sorts, shapes and sizes and deposited it wherever it chanced to be when the ice melted. At the same time, there was some isostatic adjustment with a bulge of the areas in front of the ice, causing abnormal conditions there. The continental shelf near the glaciated areas and within them is traversed by deep canyons whose counterparts have not been widely recognized in the sedimentary section. These were not all associated with glaciation as the deepest is off the mouth of the Congo River in Africa.

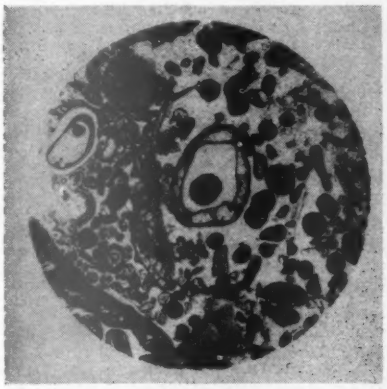

*Fig. 1—Photomicrograph of thin section of low-grade Alabama asphaltic oolitic limestone (× 7.5)*

Thus a study of recent sediments may not be sufficient to tell us all we need to know about the older ones. It may, therefore, be considered that we are devoting a great deal of our time today to studying one group or class of material and applying what we are learning to another group which we hope went through the same processes. Moreover, we admittedly know little about the second process which affected our oil reservoirs, namely lithification or cementation.

The obvious solution to our present difficulties is to develop a new technique, if necessary, and to devote much more of our attention to the older rocks in order to understand them. Since many of the processes that have taken place in these older rocks are not now understood, the study cannot be altogether observational. Many of the processes cannot be duplicated in the laboratory so that laboratory studies may prove of little value if their results are applied directly.

In other words, the study of reservoirs consists of observation and experimentation in order, not to find results directly, but to find clues to processes. Following this, the clues must be followed up to see where they lead. If they lead to a theory which appears to have wonderful possibilities, that is the place where caution must be employed. The course of sedimentary petrography is marked by the wrecks of many theories which were going to solve all of our troubles.

The geologist must exercise many of the characteristics that make a good detective. He can never start with all of the facts. He must first collect the few that are available, unearth a few clues and follow them up. Like the good detective, he must not become so enthusiastic about a single chain of evidence that he arrives triumphantly at the wrong conclusion.

### Entry of Oil Into the Reservoirs

Since oil reservoirs are under consideration, it becomes necessary to consider when oil enters the reservoir. Here there are a number of preconceived ideas which can, at least, be relegated to the background for a while. Of these, the most widely held is the idea that oil forms in shale in some way, is later squeezed out of the shale in some way, enters the reservoir and collects on highs. There is a possibility that some oil was deposited in the reservoir during the stages of deposition and lithification.

Trask[4] found organic matter amounting to from 0.3 to 7 per cent in recent sediments with a median of 1.6 per cent. He found that there were chemical changes in this organic matter in the unconsolidated subsurface layers of the fresh deposits. These did not result in the formation of oil but were more closely allied to petroleum than were the original organic substances.

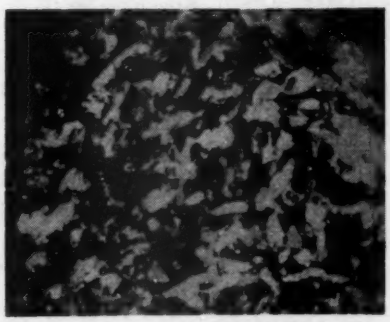

*Fig. 2—Photomicrograph of asphaltic Anacacho limestone of Uvalde County, Texas. Small angular fragments of limestone, imbedded in asphaltic matrix (× 11)*

If we assume that this material can be transformed, somehow, to oil and that during the process the percentage drops from 1.6 to 1, then 1 ton of sediments might contain 20 lb. of oil formed in place. As a ton of sediments occupy about 14 cu. ft., this proportion would represent about 3 gal. to 14 cu. ft. or about 222 bbl. per acre foot.

It is, thus, theoretically possible, if one assumes an original drainage area with three or four times the diameter of an oil pool, to postulate the in situ origin of oil with no migration from other beds and not a great deal of migration along the reservoir bed itself. This is, of course, entirely speculative.

A thin section of the Gasper limestone[5] from northern Alabama shows that bitumen was deposited at the same time as the limestone was forming. (Fig. 1.) Individual oolites may have a core of calcite, then a ring of bitumen following by more calcite. Or there may have been other combinations or more generations. The rock itself is not an oil reservoir but the association of bitumen and calcite during the period of deposition and lithification is almost as interesting as the fact that instead of theorizing as to the origin of the asphalt Utterback resorted to a technique that has been used for nearly a century in igneous petrography and produced the evidence in such a way that little theorizing is necessary.

*Fig. 3—Specimen of modern coquina artificially saturated with asphalt (× 1.5)*

In the case of the Anacacho limestone of Uvalde County, Texas, polished sections show that the rock is composed of limestone grains or a limestone "sand" together with asphalt. (Fig. 2.) That the asphalt was not introduced later was indicated by simply treating the rock with carbon tetrachloride which removed the asphalt and left a heap of unconsolidated grains of limestone. That the rock was not an asphalt-saturated coquina, as had been suggested by other geologists was determined by simply saturating a coquina with asphalt and comparing the two (Fig. 3).

Thus, the examination of thin sections, or polished sections together with some simple experiments can provide much interesting information about the hydrocarbon content of rocks. These methods can also pro-

vide a considerable increase in our knowledge of the different types or reservoir rocks, their cementation and their porosity. How many oil companies use these well-known techniques?


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## KANSAS, NEBRASKA

# Wildcat Opens Two Pools; New Zone at Stoltenberg

WILDCAT wells, making their final production tests, opened two new pools, added the Lansing lime series to the Stoltenberg pool of Ellsworth County and the Arbuckle lime to the Hansen pool of Phillips County.

**Barton County.**—The Barrett pool was opened by Vernon Oil & Gas Co.'s 1 Addie Barrett, SE NE SE 36-16-14w, pumping 266 bbl. of 40-gravity oil in Arbuckle lime at 3,434-65 ft. The hole filled 3,000 ft. with oil, with no water present, in 18 hours and when put on the beam, pumped 14 bbl. of oil an hour for 36 hours. Location of the well is about 2 miles south of the large Trapp area. Discovery was by subsurface methods.

**Barber County.**—Aladdin Petroleum Co. and Phillips 1 National Gypsum, SW NW SE 20-30-15w, in the northwest corner of the county and about 3 miles from the Sun City pool, was completed for a small pumper in Pennsylvanian sands at 4,435-56 ft. Revised potential was 129 bbl.

**Ellsworth County.**—A second pay was added to the Stoltenberg Arbuckle pool at I. W. Murfin's 1-B Loula, a wildcat drilled within the boundaries of the field in S½ SW SE 28-16-10w. The well flowed 196 bbl. of oil a day in Lansing lime at 2,980-3,010 ft., with an estimated 3,000,000 cu. ft. of gas. At the total depth of 3,010 ft., it was 300 ft. above the average producing depth in the Arbuckle.

**Phillips County.**—Cities Service Oil Co. 1 Templeton, SW SE SW 14-5-20w, west offset to the same company's discovery well which produces from the Lansing lime, was given a pumping potential of 383 bbl. of oil with no water in Arbuckle. Top of the lime was 3,530 ft. and perforations were at 3,597-3,601 ft. The hole filled rapidly with oil and additional perforations at 3,530-50 ft. increased the fluid level from 2,320 ft. to 2,440 ft. Total depth was 3,780 ft.

**Rooks County.**—Two and one-half miles northwest of the Dopita pool, Continental Oil Co. was redrilling its 1 Kriley, NW NW NW 22-8-18w, which was originally a stratigraphic test. The hole was cleaned out to 3,352 ft., acidized and filled 1,400 ft. with oil in 14 hours. It was given another treatment and drilled out to 3,374 ft. where the hole caved and was plugged back to 3,355 ft. It was swabbing 25 bbl. of 32-gravity oil a day.

### KANSAS COMPLETIONS

#### Wildcats

Barber County, discovery of Turkey Creek pool: Aladdin Pet. and Phillips 1 National Gypsum, SW NW SE 20-30-15w, pumped 129 bbl., Pennsylvanian sands 4,435-56 ft.

Barton County: Transwestern Oil 1 Evans, SE SW 35-17-11w, dry, T.D. 3,400 ft., Lansing 3,023 ft., Arbuckle 3,366 ft.

Vernon Oil & Gas 1 Addie Barrett, SE NE SE 36-16-14w, pumped 266 bbl., Arbuckle 3,434-65 ft., discovery of Barrett pool.

Ellsworth County, new pay in Stoltenberg: I. W. Murfin 1-B Loula, S½ SW SE 28-16-10w, flowed 196 bbl., Lansing 2,980-3,010 ft.

Rice County: Mid-Plains and Zephyr Drlg. 1 Sangster, E½ SE NW 13-19-8w, dry, T.D. 3,562 ft., Misener 3,423 ft., Viola 3,438 ft., Simpson 3,468 ft., Arbuckle 3,529 ft.

Rooks County: Sinclair Prairie 1 Mathews, SW NE SE 28-6-20w, dry, T.D. 3,800 ft., Lansing 3,430 ft., Arbuckle 3,740 ft., granite wash 3,771 ft.

Russell County: Harry Gore 1 Parker, SE SE SW 7-15-12w, dry, T.D. 3,295 ft., Lansing 2,999 ft., Arbuckle 3,274 ft., bailed 1½ bbl. in 2 hr. at 3,070 ft.

Sedgwick County: Lion Oil Ref. 1 Greasser, NW SW SW 14-25-2w, dry, T.D. 4,095 ft., Lansing 2,540 ft., Viola 3,887 ft., Arbuckle 4,007 ft.

Stafford County: J. H. Hershey 1 Ahnert, N½ NW NE 3-23-13w, dry, T.D. 3,925 ft., Lansing 3,469 ft., Viola 3,792 ft., Simpson 3,864 ft., Arbuckle 3,895 ft.

Stafford County, extension to Zenith: Plains Exploration 1 Kelly, E½ NE SE 8-24-11w, pumped 270 bbl., Viola 3,798-3,803 ft.

#### Fields

Carmi, Pratt County: Magnolia Pet. 3 Binger, NE NW 31-26-12w, flowed 32 bbl. an hr., Arbuckle 4,297-4,323 ft.

Deichman, Cowley County: Trees Oil 4 Franks, SE SW SE 23-31-4e, dry, T.D. 2,960 ft., Mississippi lime 2,959 ft.

Forest Hill, Russell County: Lauck & Moncrief 2 Kluesner, N½ NE SW 28-15-12w, swabbed 22½ bbl. an hr., Arbuckle 3,273-79 ft.

Hall-Gurney, Russell County: Stanolind 2 Boxberger, SW NE NW 10-14-14w, pumped 222 bbl., Lansing 2,980-87 ft., 3,008-13 ft., 3,021-25 ft., T.D. 3,253 ft.

Alva Billings 1-A Boxberger, NW SE NW 21-14-14w, dry, T.D. 3,320 ft., Lansing 3,012 ft.

Cities Service 1-B Marsh, S½ SW SE 30-14-12w, swabbed 40 bbl. in 3 hr., Gorham sand 3,093-96 ft.

Hammer, Barton County: W. N. Bartlett 1 Schulte, SE SE 26-19-12w, dry, T.D. 3,411 ft., Arbuckle 3,403 ft.

Kipp, Stafford County: Skelly and Texas 8-F Kipp, S½ SE SE 22-25-14w, pumped 308 bbl., Lansing 3,845-3,901 ft.

Kraft-Prusa, Barton County: Stanolind 2 Lamatsch, NE NE SW 16-17-11w, dry T.D. 3,310 ft., Arbuckle 3,306 ft.

Black-Marshall Oil 1-A Dolecheck, SE SW 24-16-12w, pumped 120 bbl., conglomerate sands 3,348-69 ft.

Lauck & Moncrief 1 Grossardt, NE NW NW 16-17-11w, swabbed 82 bbl. in 3 hr., Arbuckle 3,292-99 ft.

Krug, Russell County: National Ref. 2 Krug, NE SW SE 8-14-14w, pumped 120 bbl., Lansing 3,050-3,148 ft.

Morel, Graham County: Cities Service 2-A Sutor, NW NW SE 22-9-21w, 1,260 bbl., Arbuckle 3,835-36 ft.

Mueller, Stafford County: Stanolind 2 Umstead, S½ NW SW 28-21-12w, pumped 299 bbl., Arbuckle 3,596-3,609 ft.

Trapp, Russell County: Pryor & Lockhart 1 Krug, S½ SW SW 3-15-14w, dry, T.D. 3,281 ft., Arbuckle 3,271 ft.

Van Patten, Norton County: N. Appleman 1 Smith, SE SE SE 22-4-21w, dry, T.D. 3,680 ft., Arbuckle 3,625 ft.

Virgil, Greenwood County: Aikman & Braden 1 Hout, SW NW 11-24-12e, pumped 25 bbl., Mississippi lime 1,752-66 ft.

Witt, Russell County: National Ref. 4 Boxberger, SW NW SW 3-14-14w, 823 bbl., Lansing 2,987-3,008 ft.

Zenith, Stafford County: Derby Oil 4 McNickle, E½ SW NE 1-24-11w, flowed 255 bbl., Misener sand 3,699-3,721 ft., Viola lime 3,721-62 ft., T.D. 3,765 ft.

## FOREST CITY BASIN

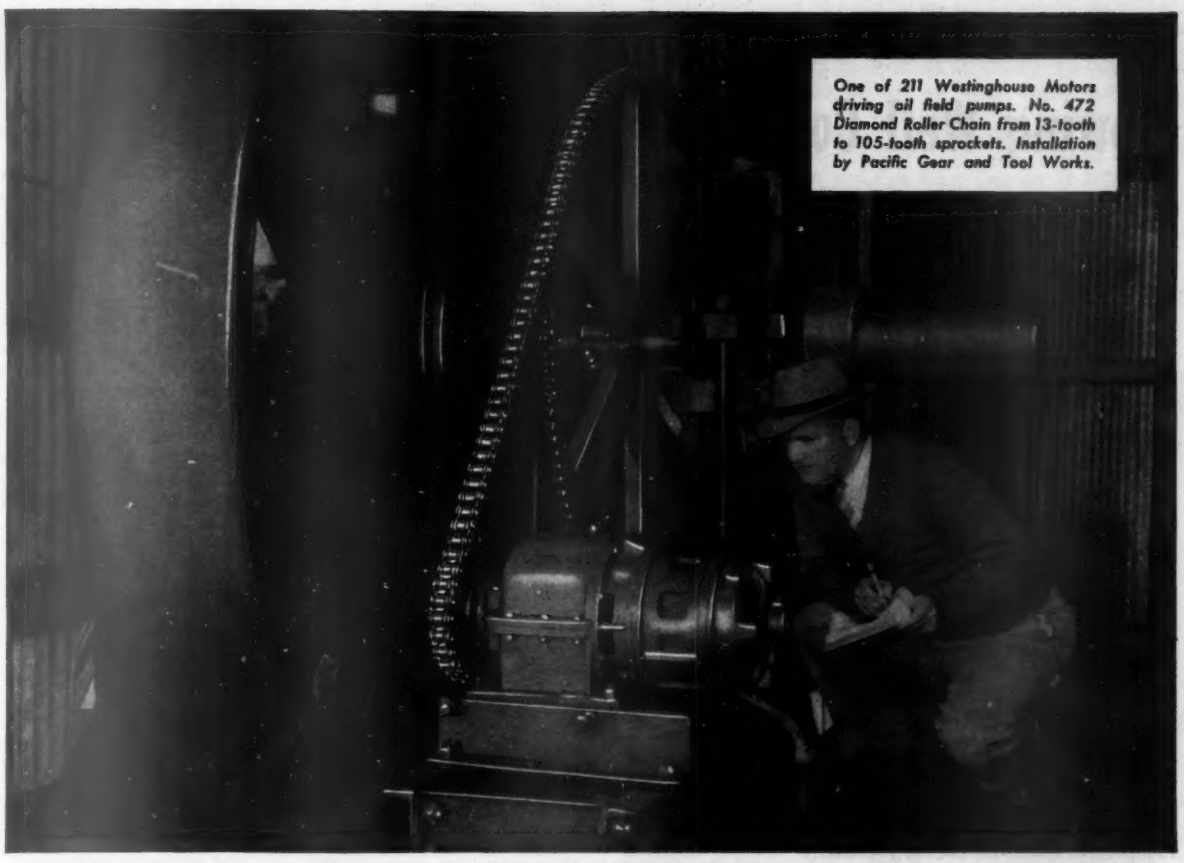
ST. JOSEPH, Mo.—Nebraska Producing & Refining Co. has reached the Hunton lime at 2,171 ft. in its 1 D. E. Bohrer in NW 10-1n-14e, Richardson County, Nebraska, in the Dawson pool. Casing was cemented and cable tools will be moved in to drill plug and test as soon as the muddy ground dries up. The area was extremely wet in recent days and much of the surrounding territory was under water. The 1 Bohrer is between two producers.

C. W. Murchinson has announced location for 1 Federal Land Bank in SE cor. 28-10s-15e, Shawnee County, Kansas. This is scheduled to be a tight hole. Two new locations have been announced for the McLouth pool in Jefferson and Leavenworth counties, Kansas. McLaughlin 1 Dietrich will be drilled in NE NW 34-8s-20e, Leavenworth County, and has a machine on location. Sagamore Oil Co. 1 Snyder will be drilled in SW NW 31-9s-19e, Jefferson County.

### MISSOURI COMPLETIONS

Atchinson County: J. E. Palenski 1 Ed White, SE SE NE 11-64n-40w, dry, T.D. 1,502 ft.

Clinton County: Hendrix 3 Estep, NE NE SW 27-56n-30w, dry, T.D. 557 ft.



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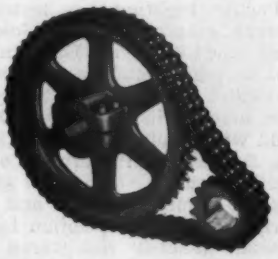


DIAMOND ROLLER CHAINS

## CALIFORNIA

# Flowing Well Completed in Sentous Zone at Inglewood

LOS ANGELES, Calif.—Tide Water Associated Oil Co. centered the attention of operators on the Inglewood field of the Los Angeles Basin this week by completing a flowing well in the Sentous zone of Miocene age and thus indicated this field may be counted upon for increased production. Tide Water Associated's new well, 78 Vickers, is the most southeasterly producer at Inglewood from the Sentuos zone and its completion automatically proves up several additional locations.

Further to the southeast, Standard has apparently failed to develop commercial production in a zone lying between the Rubel and Sentous zones at a depth of 5,250 ft. The well will be deepened to the Sentous. Development work at Inglewood has been at a standstill for almost a year and only recently was work resumed.

**June allotment.**—The general production situation in California has been causing serious concern to many producers and especially to the allocation committee which assigns daily quotas to the various fields. This complex problem has become an important one because gas and crude oil production must be kept in balance. Demand for natural gas has declined very materially in recent weeks. As a consequence, the allocation committee has been forced to reduce the allowable production of some fields for June and may find it necessary to make further reductions during July and August. The present surplus of natural gas has resulted in closing many dry gas fields in the San Joaquin Valley and in the shutdown of most high gas-oil-ratio wells especially in the Kettleman North Dome, Belridge North and Coalinga Nose fields.

Pacific Lighting has resumed its storage program in the Goleta gas field and Southern California Gas Co. has started storing surplus gas in the Playa Del Rey field. The productive acreage in the Playa Del Rey field was acquired early last year by the Defense Plant Corp. in order to facilitate storage of natural gas during the summer months and during periods of low consumption. Last year a small quantity was stored during the late summer months but since that time Southern California Gas has installed compressor facilities to step up the induction rate. It is estimated that from 300,000,000 to 500,000,000 cu. ft. of natural gas can be stored at Playa Del Rey.

**Important legal ruling.**—The state attorney general in a recent ruling has held that the State of California owns subsurface rights lying beneath all state highways including any and all minerals and hydrocarbons located thereon. This is the first time the state has indicated any interest in the subsurface conditions of highways and its full implication is quite clear. Many state highways run through productive fields and the ruling opens the way for the state to grant permits for the development of production beneath highways by directional drilling. State authorities look on the matter as another method of increasing state revenues but operators feel it will result in closer drilling and in some cases would force additional offsets.

### LOS ANGELES BASIN COMPLETIONS

Huntington Beach, Orange County: McVicar, Rood & McCallen 2 fee, 2-6s-11w, pumped 60 bbl., 19.1-gravity, 0.3 per cent cut, T.D. 3,460 ft., perf. 3,415-45 ft., completed in upper Ashton, Pliocene.

Signal Oil & Gas Co. 42-A Bolsa, 35-5s-11w, pumped 125 bbl., 21.1-gravity, 10 per cent cut, T.D. 4,587 ft., perf. 3,876-4,586 ft., completed in lower Bolsa, Pliocene.

Standard 48-A Huntington, 3-6s-11w, pumped 183 bbl., 16.1-gravity, 15 per cent cut, T.D. 3,550 ft., perf. 3,190-3,321 ft., 3,433-3,542 ft., completed in lower Bolsa, Pliocene.

Inglewood, Los Angeles County: Tide Water Associated 78 Vickers, 7-2s-14w, flowed 875 bbl., 30.9-gravity, 0.5 per cent cut, 950,000 cu. ft. gas, 38/64-in. bean, pressures 750/1,000 lb., T.D. 8,287 ft., perf. 7,960-8,286 ft., completed in Sentous, Miocene.

Torrance, Los Angeles County: Texas Co. 11 Oakley, 30-4s-11w, pumped 56 bbl., 13.9-gravity, 5 per cent cut, T.D. 3,685 ft., gravel packed perf. 3,530-3,651 ft., completed in Ranger, Pliocene.

Turnbull Canyon, Orange County: Continental 5 Turnbull, 13-2s-11w, pumped 76 bbl., 25.9-gravity, 20 per cent cut, T.D. 3,630 ft., perf. at intervals 3,200-3,480 ft., completed in Turnbull, Miocene.

### SAN JOAQUIN VALLEY

**Fresno County.**—Standard of California should soon determine how the Pleasant Valley field is going to shape up as its 28-21-F in 21-20s-16e is on top of the Gatchell sand pay. This is the most easterly well in the field and with the data already known should give a fairly good idea of the condition of the sand with regards to permeability and to structural conditions.

The Gatchell oil sand found at Pleasant Valley to date has been more comparable to the McAdams sand at Kettleman Hills than the Gatchell zone at Coalinga Nose. The top of the Pleasant Valley sand is tight but permeabilities are more favorable with depth.

Superior Oil Co. has beaned back its discovery well in the Wheatville district of Fresno County to 75 bbl. per day by reducing the bean to 7/64-in.

**Kern County.**—Standard has started an important outpost in the Greeley field on the Wegis lease in 21-29s-26e. Standard has been aggressively leasing south and southeast of the Greeley field.

Continental is starting an outpost or semiwildcat in the Strand district on land leased from Kern County Land Co. in 4-30s-26e, but this well will not reach the critical depth for another month or so.

**Elk Hills.**—The U. S. Navy Department, continuing its development program in the Elk Hills field of Kern County, completed two more new wells this week and has three other potential producers under way. The Navy's present program contemplates 50 wells.

### SAN JOAQUIN VALLEY COMPLETIONS

Belridge, South, Kern County: Belridge Oil Co. 44-33 fee, 33-28s-21e, pumped 5 bbl. net, 13.8-gravity, 90 per cent cut, T.D. 2,985 ft., perf. 2,260-2,984 ft., completed in lower Belridge, Pliocene.

Belridge Oil 58-34 fee, 34-28s-21e, pumped 50 bbl., 13.5-gravity, 30 per cent cut, 100-mesh perf. 479-790 ft., T.D. 790 ft., completed in South Belridge zone, Pleistocene.

General Petroleum 11-1 Belridge 1-29s-21e, pumped 45 bbl., 14.3-gravity, 30 per cent cut, T.D. 997 ft., 100-mesh perf. 792-996 ft., completed in South Belridge zone, Pleistocene.

General Petroleum 36-2 Belridge, 2-29s-21e, abandoned because of casing trouble., T.D. 1,165 ft.

General Petroleum 89-2, 2-29s-21e, pumped 50 bbl., 13.1-gravity, 15 per cent cut, T.D. 1,250 ft., P.B. 928 ft., perf. 567-657 ft., 753-856 ft., 886-926 ft., completed in South Belridge zone, Pliocene.

Buena Vista Hills, Kern County: Standard 75-11-D, 11-32s-24e, pumped 41 bbl., 28.3-gravity, 5 per cent cut, T.D. 2,633 ft., perf. 2,555-2,633 ft., completed in Buena Vista zone, Pliocene.

Coalinga, East, Fresno County: Standard 19-35-A fee, 35-19s-15e, pumped 105 bbl., 27.5-gravity, 2 per cent cut, T.D. 3,642 ft., perf. 3,279-3,399 ft., 3,501-3,621 ft., completed in East Coalinga zone, Miocene.

Standard 24-35-A fee, 35-19s-15e, pumped 157 bbl., 26.9-gravity, 4.1 per cent cut, T.D. 3,505 ft., 60-mesh perf. 3,383-3,500 ft., completed in East Coalinga zone of Miocene age.

Elk Hills, Kern County: U. S. Navy 76-2-G, 2-31s-24e, pumped 140 bbl., 13.2-gravity, 2.8 per cent cut, T.D. 3,138 ft., P.B. 3,023 ft., 60-mesh perf. 2,974-3,023 ft., completed in Tupman zone, Pliocene.

U. S. Navy 47-27-S, 27-30s-24e, pumped 576 bbl., 15.2-gravity, 4 per cent cut, T.D. 3,314 ft., 60-mesh perf. 3,233-60 ft., 3,290-3,305 ft., completed in Tupman zone, Pliocene.

Fruitvale, Kern County: Western Gulf 18 Red Ribbon, 27-29s-27e, pumped 144 bbl., 16.3-gravity, 9 per cent cut, T.D. 4,360 ft., perf. 3,700-30 ft., 3,795-3,825 ft., 3,860-3,930 ft., 3,950-60 ft., 4,010-30 ft., 4,050-4120 ft., 4,180-90 ft., 4,230-70 ft.,

*(Continued on Page 105)*

# Ordovician Production Indicated At Yates Pool

MIDLAND, Tex. — Prospects for opening a new Ordovician producing sector were bright when Standard Oil Co. of Texas 1 Douglas Oil Co. et al, SE SE Section 9, Block 194, H.&G.N. Ry. Survey, on west flank of the Yates pool, Pecos County, showed 50 ft. of free oil and 10 ft. heavily oil and gas-cut mud on drill-stem test from 8,650 to 8,731 ft. After the testing tool was open 1 hour, the well started blowing air, and the oil was recovered. Top of the Ellenburger section was tentatively placed at 8,740 ft., but some geologists believe that the Ellenburger lies considerably deeper. Cores from 8,787-97 ft. were a blue dolomite which still may be in the Simpson. At this depth vertical fractures were found and a sulfur odor noted.

In the Heiner area of Pecos County, Culbertson & Irwin 1 R. G. Heiner, Section 589, G.C.&S.F. Survey, indicated a ⅝-mile southwest extension to the one-well pool when it flowed 3½ bbl. oil per hour during 5-hour test after acid treatment of 2,000 gal. The hole is bottomed at 5,506 ft. The flow was killed with mud, and tubing pulled to be rerun with packer set at 5,350 ft. Top of the Ellenburger was called 5,029 ft., which is over 100 ft. higher than the discovery, Culbertson & Irwin 1 Mary Heiner, NE NE same section.

**Andrews County.**—Sinclair Prairie Oil Co. 1 Ratliff & Bedford, NW NW Section 14, Block 73, Public School Land Survey, is a new location for an 11,000-ft. Ellenburger test. It is 8 miles due west of the Embar-Ellenburger pool, and on the northwest of a strike through the Apco-Warner, Abell, Sand Hills, and Wheeler Ellenburger areas. Humble Oil & Refining 1 Crews and Mast, Section 8, Block A-34, Public School Land, reported top of Brown lime at 4,050 ft., elevation 3,212 ft., and was drilling ahead below 4,600 ft.

**Yoakum County.**—Rowan Drilling Co. 1 Dixon, NE NW Sec. 571, Blk. D, J. H. Gibson Survey, wildcat 5 miles north of the Wasson pool, showed good indications of opening a new productive sand when it showed oil in cores from 5,400-40 ft. A drill-stem test from 5,368-5,440 ft. open 55 minutes showed slightly oil-cut drilling mud, and the hole was reamed and will be carried deeper. Pay is topped in the Wasson field at about 5,200 ft.

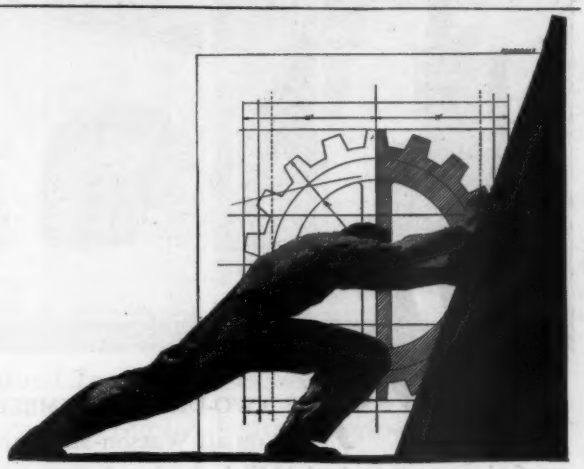
**Howard County**—The new Vincent area promises rapid development as northwest and southeast offsets were staked to the discovery, and across the line in Mitchell County, Ben Dansby announced plans to deepen an old dry hole to 4,100 ft. The new test is located in NE NE NE Section 33, Block 26, H.&T.C. Ry. Survey, and was drilled to total depth 3,205 ft. by J. C. Maxwell. It is 4½ miles southeast of the discovery. Another deepening job for the area is Guthrie and Cosden 1 Conrad, C NW Section 79, Block 20, Lavaca Navigation Co. Survey, Borden County, 3½ miles north of the discovery.

**WEST TEXAS COMPLETIONS**

**Wildcats**

Crockett County: Moore Bros. 1-12 J. M. Shannon est., 660 ft. from N and W, Sec. 12, Blk. FF, pump 45 bbl., P.B. to 2,402 ft. from T.D. 2,732 ft. Discovery.

Moore Bros. 1-21 J. M. Shannon est., elev. 2,563 ft., dry, T.D. 2,752 ft.

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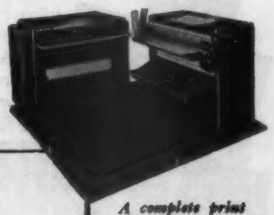

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McCulloch County: C. M. Joiner Corp. 1 Lawson, 860 ft. from N, 350 ft. from E, V. Hohman Sur., dry, T.D. 1,556 ft.

Reagan County: Humble Oil & Ref. 1-B Sawyer Cattle Co., 1,320 ft. from N, 1,650 ft. from W, Sec. 13, Blk. 1, T.&P. R.R. Sur., Strawn 9,330 ft., Ellenburger 9,956 ft., dry, T.D. 9,995 ft.

**Fields**

Apco-Warner, Pecos County: Bay Pet. 1 Humble-Shearer, S¼ E¼ Sec. 99, Blk. 10, H.&G.N.R.R. Sur., elev. 2,434 ft., flow 662 bbl., pay 4,268 ft., perf. 208 shots 4,268-80 ft., P.B. to 4,680 ft. from T.D. 4,705 ft.

Barnhart, Reagan County: Amerada Pet. 1 University unit, NW SW Sec. 2, Blk. 48, University Sur., elev. 2,750 ft., flow 2,421 bbl., Ellenburger pay 9,020 ft., perf. 9,040-67 ft., T.D. 9,139 ft.

Amerada Pet. 1-RQ University, NW NW Sec. 9, Blk. 48, University Sur., elev. 2,751 ft., flow 1,492 bbl., Ellenburger pay 9,104 ft., T.D. 9,185 ft.

McCamey, Upton County: Trebol Oil 3-C R. P. Ricker, 2,078 ft. from E, 1,883 ft. from N, Sec. 6, E. G. Grooms Sur., elev. 2,929 ft., pump 168 bbl., lime pay 2,510 ft., T.D. 2,558 ft.

North Cowden, Ector County: Stanolind Oil & Gas 6-D Midland Farms, 1,880 ft. N, 91 ft. W of SW cor. Sec. 44, Blk. 42, G.&M.M.B.&A. Sur., but in W. L. Callahan Sur., elev. 3,078 ft., flow 563 bbl., pay 4,650 ft., shot 580 qt., T.D. 4,825 ft.

Slaughter, Cochran County: Bay Pet. 9 Humble-Mallett, 580 ft. from N and E Lab. 19, Lge. 53, Scurry County School Land Sur., elev. 3,626 ft., flow 552 bbl., lime pay 5,004 ft., acid, T.D. 5,033 ft.

Slaughter, Hockley County: J. C. Hawkins 33-A Mallett, 580 ft. from S and W Lab. 11, Lge. 47, Edwards County School Land, flow 1,011 bbl., lime pay 4,910 ft., acid 11,500 gal., T.D. 4,987 ft.

Taylor-Link, Pecos County: Milton Unger 8-A University, SW NW Sec. 33, Blk. 16, University Sur., I.P. 88 bbl., lime pay 1,396 ft., shot 95 qt., T.D. 1,422 ft.

Wasson, Yoakum County: DeKalb Agric. Ass'n. 3 Annie Armstrong, 1,875 ft. from N, 2,085 ft. from E, Sec. 889, J. H. Gibson Sur., flow 596 bbl., lime pay 4,999 ft., acid 14,000 gal., T.D. 5,096 ft.

DeKalb Agric. Ass'n. 5 Annie Armstrong, 1,875 ft. from W, 4,515 ft. from N, Sec. 889, Blk. D, J. H. Gibson Sur., elev. 3,526 ft., flow 613 bbl., lime pay 5,010 ft., acid 10,000 gal., T.D. 5,077 ft.

Devonian Oil 4 Ruth Bennett, 760 ft. from N, 560 ft. from E, Sec. 631, Blk. D, J. H. Gibson Sur., elev. 3,588 ft., flow 567 bbl., lime pay 5,143 ft., acid 10,000 gal., T.D. 5,291 ft.

## SOUTHEAST NEW MEXICO

HOBBS, N. M.—Two new discoveries were in prospect for Southeast New Mexico, one in Eddy County and the other in Lea County. In Eddy County, Jones & McKee 2 State, SE SE 2-19s-29e, topped pay at 2,575 ft., drilled to 2,600 ft. treated with 3,000 gal. acid and retreated with 5,000 gal. acid, and was flowing an undertermined amount of 37.5° gravity oil. In Lea County, south of the Maljamar pool, Maljamar Oil & Gas Co. 2 Chessman, NE NE 22-18s-32e, topped pay at 4,648 ft., drilled into water from 4,829-40 ft., and was plugging back to 4,720 ft. to shut off water. Oil had risen 200 ft. in the hole from the pay section.

**SOUTHEAST NEW MEXICO COMPLETIONS**

Maljamar, Lea County: Johney Cockburn 12-B Miller, SE SE 25-17s-32e, flow 100 bbl., pay 4,010 ft., shot 290 qt., P.B. to 4,257 ft. from T.D. 4,300 ft.

*(Continued on Page 127)*

## EASTERN TEXAS

### Wood County Discovery Going to Paluxy

DALLAS, Tex.—Interest in East Texas continued to be centered on Jackson & Fisher 1 O. M. McCarley, 493 ft. from north, 400 ft. from west, 150-acre tract, Hazard Anderson Survey, northeast of Quitman, as it continued drilling after reporting good showing of oil in Woodbine sand. It is reported that royalty and leases in the vicinity, on strike northeast and southwest from the well, were bringing high prices, with royalty under the well bringing $600 per acre, and leases 4 miles northeast selling for $50 per acre late in the week. The well had low gravity oil shows from the sub-Clarksville, and 36-gravity oil showings in the Woodbine sand from 5,399-5,410 ft., but decided to complete contract to Paluxy sand before making completion attempt.

**Franklin County.**—L. A. Grelling 1 J. P. Stanley, W. B. Jordan Survey, Lake Franklin area, Paluxy failure deepening to Travis Peak horizon, topped Glen Rose at 6,410 ft., massive anhydrite at 7,455 ft., base massive anhydrite at 7,635 ft., and was drilling close to 7,900 ft.

**Kaufman County.**—Sun Oil Co. 1 Rutledge, Smackover lime test, 2,376 ft. from southeast, 660 ft. from northeast, 200-acre tract, Parsons Survey, topped Travis Peak at 6,481 ft. and was drilling below 6,600 ft.

#### EAST TEXAS COMPLETIONS

**Wildcats**

Kaufman County: Mae Belcher et al 1 Beulah Workman, 660 ft. from S and W 67.2-ac. tract, N. Daugherty Sur., dry, T.D. 2,510 ft.

Hunt County: Ohio Oil 1 V. Langford, 2,357 ft. from N, 1,934 ft. from E, James Hamilton Sur., elev. 484 ft., junked hole, T.D. 2,888 ft.

Panola County: Continental Oil 1 Louis Werner Sawmill Co., 2,913 ft. from S, 2,700 ft. from W, 791-ac. tract, J. Palmer Sur., elev. 279 ft., Travis Peak 6,080 ft., Paluxy 2,838 ft., lower Pettit 6,047-56 ft., dry, T.D. 6,431 ft.

**Fields**

Cayuga, Anderson County: Carter-Gragg Oil Co. et al 2 R. W. Bass, 733 ft. from E, 467 ft. from S, 40-ac. tract, Ernest Ritter Sur., dry, T.D. 4,170 ft.

Hawkins, Wood County: Humble B-10 L. A. Bryan, 1,065 ft. from N, 1,665 ft. from E, 202.9-ac. tract, Esparcia Sur., elev. 436 ft., Woodbine 4,727 ft., flow 65 bbl., T.D. 4,901 ft.

Humble Oil & Ref. 1-B L. O. Preddy, 450 ft. from N'ly S, 580 ft. from W'ly W, John Moseley Sur., elev. 396 ft., flow 425 bbl., sand pay 4,627-39 ft., perf. 4,627-39 ft., T.D. 4,752 ft.

Humble Oil & Ref. 2 F. Scott, 467 ft. from S and E, 80-ac. lease, Edward Wideman Sur., elev. 421 ft., flow 289 bbl., pay 4,648 ft., perf. 4,788-96 ft., 4,862-66 ft., T.D. 4,871 ft.

Quitman, Wood County: Shell Oil 1 P. J. Kirkland, 747 ft. from N, 583 ft. from W of tract, E. Goodsir Sur., elev. 432 ft., flow 784 bbl., pay 6,154-80 ft., 6,232-60 ft., T.D. 6,357 ft.

*(Continued on Page 107)*


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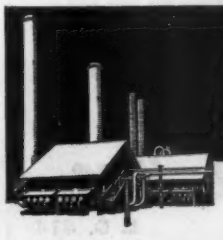

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## APPALACHIAN FIELDS

### Beaver County, SW. Penna., Test Gets Show in Berea

PITTSBURGH, Pa.—In Ohio Township, Beaver County, of Southwest Pennsylvania, the deep test of the South Penn Oil Co. on the Cunningham-Vlatovich unit, placed the Berea 946-54 ft. with a show of oil and gas and is now in the top of the Gantz sand.

**Fayette County.**—In South Union Township, Fayette County, New Penn Development Co., William E. Snee et al shut down for engine repairs at 8,567 ft. in 2 Indian Creek Coal Co. and have most probably reached the top of the Oriskany sand from sample study. No gas was present in the Onondaga chert beds. Here Peoples Natural Gas Co. has sidetracked the old hole in 1 Walters after a bad fishing job and are drilling at 7,356 ft. In Wharton Township, Greensboro Gas Co. is drilling 4 Barton at 389 ft.

**Westmoreland County.**—In Derry Township, Westmoreland County, Peoples Natural Gas Co. is drilling the Oriskany test on the Camilla Giffin farm at 4,210 ft. In Ligonier Township, New Penn Development Co., William E. Snee et al have the tools hung up at 8,220 ft. in the test on the John and Eleanor Beck farm and have been unable to whip the line off. The Onondaga has not been reached and it is believed that there is a cave on top of the tools.

**Maryland.**—In Garrett County, on the Accident dome, William E. Snee et al have the rig standing for the test on the DeLeon T. Rush farm and are rigging up.

#### SOUTHWEST PENNSYLVANIA COMPLETIONS

Fayette County, German Township: George Bortz 1 George Huffman, 400,000 cu. ft. gas, Fifth sand 2,311 ft., gas 2,313-19 ft., T.D. 2,370 ft.

Nicholson Township: Duquesne Gas Co. 3 Ellsworth Johnson, dry, through Fifth sand, T.D. 2,630 ft.

Greene County, Morgan Township: Carnegie Natural Gas Co. 2 Samuel H. Braden, 119,000 cu. ft. gas, Bayard stray 3,012-3,046 ft., gas 3,102-14 ft., gas 3,044-45 ft., T.D. 3,076 ft.

Washington County, Hanover Township: George Freshwater et al 3 Richard D. Koethe, 1½ bbl. Berea, T.D. 1,188 ft.

Somerset Township: Manufacturers Light & Heat Co. 1 Silas Jones, 221,000 cu. ft. gas, Gordon sand 2,662-95 ft., gas 2,696 ft., T.D. 3,114 ft.

South Franklin Township: Foley & Williams 1 T. J. Walker, dry, Big Injun sand 1,664 ft., T.D. 1,803 ft.

#### WEST VIRGINIA

**Tucker County.**—In Dry Fork district, Ohio Oil Co. is drilling at 5,460 ft. in gray shale in the test on the Kaemmerling tract.

**Wirt County.**—In Tucker district, Wirt County, Columbian Carbon Co. is drilling the Oriskany test on the Virgie Mason farm at 1,698 ft.

**Wood County.**—In Slate district, Wood County, United Fuel Gas Co. is drilling 5263 F. R. Hart at 620 ft. and 5264 J. A. Goudy at 350 ft.

#### WEST VIRGINIA COMPLETIONS

Boone County, Crook district: Pond Fork Oil & Gas 7 fee, 73,000 cu. ft. gas, Big lime 2,469 ft., Injun 2,476 ft., Berea 2,977 ft., T.D. 2,988 ft.

Scott district: United Fuel Gas Co. 5206 Horse Creek C. & L. Co., 762,000 cu. ft. gas, Big lime 1,327 ft., Injun 1,350 ft., Berea 2,029 ft., brown shale 3,200 ft., T.D. 3,493 ft.

Calhoun County, Sherman district: Hope Natural Gas Co. 9637 S. A. McCartney 2,281,000 cu. ft. gas, Big Injun sand, T.D. 1,964 ft.

South Penn Natural Gas Co. 16 J. S. Sharp, ½ bbl. before shot, Berea, T.D. 2,086 ft.

Clay County, Buffalo district: Pittsburgh & West Virginia Gas Co. 7916 Elk River L. & M. Co., 356,000 cu. ft. gas, Big Injun sand, T.D. 1,944 ft.

Henry district: Clay Gas Co. 10 Adena Corp., dry, through Berea, T.D. 2,777 ft.

Harrison County, Sardis district: Eagle Gas Co. 1 O. C. Strother, 50,000 cu. ft. gas, Fifth sand, T.D. 2,625 ft.

Pittsburgh & West Virginia Gas Co. 1 Mary M. Newlon, dry, through Speechley sand, T.D. 4,315 ft.

Kanawha County, Poca district: Shale Gas Co. 2 Sarah S. Dawley, dry through Big Injun sand, T.D. 1,980 ft.

Lincoln County, Jefferson district: David Gas Co. 4 David Miller, drilled deeper to brown shale, 1,400,000 cu. ft. gas.

Ritchie County, Union district: Mud Lick O. & G. Co. 1 Loretta Goff, dry through Berea, T.D. 2,554 ft.

Upshur County, Banks district: Cumberland and Allegheny Gas Corp. 340 P. A. Darnell, 53,790 cu. ft. gas, Gordon Stray sand, T.D. 2,327 ft.

*(Continued on Page 112)*


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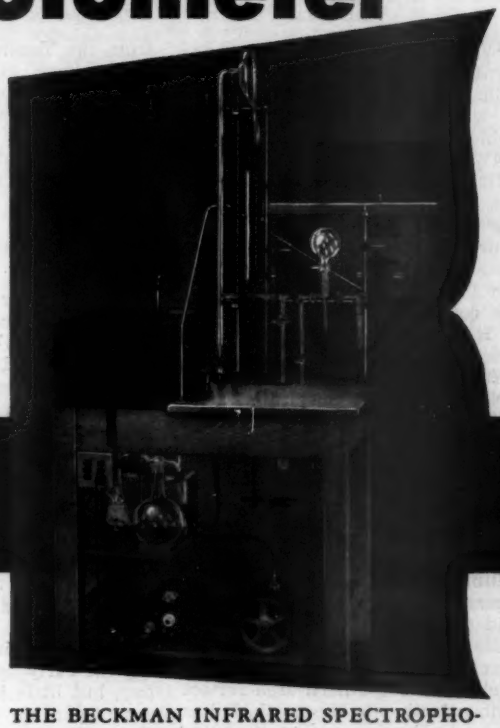

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## ROCKY MOUNTAIN AREA

# Tensleep Production Extended To West at Elk Basin

DENVER, Colo.—An important extension of the Tensleep pay in the Elk Basin field, northern Wyoming, was chalked up this week in the Ohio Oil Co. 3 Mack-OPC-7, NE NW NW 31-58n-99w, ¾ mile west of the Minnelusa Oil Corp. 1 E-T Henderson, the discovery well, which was completed last December for 100 bbl. an hour. The Ohio well, which is not yet listed as a completion, flowed 308 bbl. in 13 hours through perforations in the casing opposite the Tensleep sand. It is testing by stages and is expected to increase. Total depth is 4,854 ft.; the top of the Tensleep was at 4,645 ft. and the perforated zone is at 4,654-4,824 ft. These wells are in the southern part of the field and separated from the field proper by a number of faults. The top of the pay was found about 200 ft. lower on structure than the discovery and lower than was expected.

Drilling in the field has not yet progressed to the point where it can be said definitely whether the faults continue from the surface down into the deeper beds, or to what extent the wells in the southern area reflect conditions farther to the north. It has been shown, however, that the dips are very steep on the flanks and some difficulty has been encountered in keeping holes from deviating from the vertical. This is especially true of Stanolind's 1 Dengler, at the north end of the structure and on the Montana side, and Minnelusa's 1 E-T-F Henderson, to the east of the discovery. Minnelusa's 1 E-T Zimmerman, also on the Montana side, and more than ½ mile west and a little south of the Dengler well, has had less difficulty in keeping the hole straight. The Dengler well is drilling at 4,272 ft. and progress is slowed up by frequent cementing back to straighten hole. A key well is Yale's 1 Watson, ½ mile southwest of the Ohio 3 Mack and farther down structure as shown by subsurface geology based on the Frontier sand.

**May have to move camps.**—The Elk Basin field is located in a basin surrounded by a rim rock composed of Eagle and Mesa Verde sandstones which rise 400 to 500 ft. above the floor. Within the basin are the camps of the Ohio, Continental and Stanolind companies which have been maintained since the field first came into production. The hydrogen sulfide gas which comes out with the oil from the Tensleep has a tendency to settle down in the basin, and with the drilling program now under way, bringing in new wells, the obnoxious and dangerous gas is expected to become more offensive. Methods of piping it off or burning it in some practical way are being considered. If no remedy is found, it may be necessary to move the camps into the hills.

**Deep test for Lance Creek.** — Ohio Oil Co. has gone back into its 8 Converse Sheep, NW SE SW 32-36n-65w, on top of the Lance Creek structure, and will deepen it around 500 ft. from old total depth of 5,421 ft. to test the Bell sand and the Madison lime. It is a unit well with the Ohio company as the operator. It was completed in the spring of 1940 for 1,340 bbl. initial in what then was known as the Joss sand, but now called the lower Leo. It has been considered highly probable that additional reserves in the field would be found in horizons below the Leo. Two wells were reported drilled into the Bell sand during the early development of the Leo pay, but little information was given out regarding the results. One of these, Continental 10 Tom Bell, in 34-36n-65w, went to 6,256 ft. and had the top of the Madison at 5,640 ft., with a thin oil sand just above. The Ohio company drilled into a deeper horizon and was reported to have had a good well, but it was plugged back and no confirmation was ever made.

**Western Colorado test.**—The Frontier Refining Co. has released a location for its 1 Government, CSL NW NW 32-2n-96w, on the White River structure, 35 miles east of the Rangely field, and 15 miles southwest of the Wilson Creek field, in Rio Blanco County. Contract was let to the Kerlyn Oil Co. for a 6,500-ft. test and the well is due to spud by July 1. The Kerlyn company and Lu Dick, of Denver, are partners with Frontier in the operation. Frontier is unit operator on a 13,000-acre unit. The structure has been known for many years and shallow gas was discovered as far back as 1890. Some drilling was done in 1918-19, and still more in 1923-24, the deepest well going to 2,700 ft. Nearly all the wells drilled near the crest had some gas in the Wasatch ranging from 2,000,000 to 15,000,000 cu. ft. These wells are shut in. In 1929, the Texas Co. made a deep test ¾ of a mile to the northwest of the new location, going to 5,984 ft. and stopping in the base of the Laramie. It had some gas and shows of oil in several horizons. The surface formation is Wasatch of Tertiary age.

**Saturation showing in North McCallum well.** — Continental Oil Co. 5 Pollock, C NE SW 2-9n-79w, North McCallum dome, Jackson County, Colorado, is coring in saturated oil sand at 4,990 ft. in the Frontier, topped at 4,909 ft. The location is almost a mile to the northwest of 1 Sherman, the discovery well, which came in in December 1926 for 350 bbl. of oil and 20,000,000 cu. ft. of carbon dioxide gas at 5,137 ft. It was afterwards deepened 10 ft. and increased to 450 bbl. and 30,000,000 cu. ft. The discovery was drilled with cable tools and the gas, when released from the sand, expanded and came out at a temperature of 110° below zero, turning the oil into a mush. An offset on the north was similar to the discovery. The same situation was found to exist on the south dome. The present well is being drilled with rotary and heavy mud is being used to control the gas. J. C. Johnston, manager of the producing department, says no trouble is anticipated in completing it under modern methods. Whether it will be completed in the Frontier or carried on down to the Dakota has not yet been decided. The oil tests around 54 gravity. A test drilling on the south dome has not yet resumed since the winter shutdown.

**Another producer on McGuinness unit.**—Glacier Production Co. 2 McGuinness unit, SE SW SW 5-35n-5w, on west side of the Cut Bank gas field and 2 miles east of the nearest oil well, except for the well it offsets, cored 12 ft. of the upper Sunburst at 2,833-45 ft. and still was in sand when gas from the braden head accidentally caught fire and burned the rig. It is now flowing 10 bbl. an hour. It is ¼ mile north of 1 McGuinness unit, which came in a year ago flowing an average of 700 bbl. daily for the first 10 days. Two wells since drilled 1½ and 2 miles to the north and northwest seeking to discover the trend of the pool missed the pay.

**Sinclair to test Bell Springs.**—Sinclair-Wyoming Oil Co. has entered the Bell Springs-O'Brien Springs district south of the Mahoney Dome oil and gas field in Carbon County, Wyoming, and is building rig for a test on the NW NE SE 32-24n-88w. Location is 10 miles south of Mahoney and 5 miles southwest of a test drilled on the Johnson lease last year by Continental Oil Co. The latter well went to 5,004 ft. and tested the Tensleep without results. Following this failure, Sinclair took over the Johnson block and spotted the new well after shooting the area.

**Amerada making surveys.**—Amerada Petroleum Corp. has moved a

seismograph crew into the San Juan basin in Northwest New Mexico to continue its extensive survey of that entire area which was begun last year. The party will make its headquarters in Aztec and is expected to be in the field for the remainder of the year. Last year the Stanolind Oil & Gas Co. had crews working in the district for several months, their surveys extending over into Northeast Arizona and Southeast Utah, and on the basis of this work, Argo Oil Corp., an affiliate, and Salmount are drilling a test in Northeast Arizona. In 1940 and 1941 the Atlantic Refining Co. had geophysical crews in the area and were reported to have acquired some holdings in the Bloomfield-Aztec district and to be particularly interested in the territory on the Colorado side. There are numerous structures in the basin, some producing gas and others showing numerous small wells at shallow depths. Outside of the drilling of Pennsylvanian tests on the Rattlesnake dome by Continental, the deep wildcats are few in number. Hogback, which Stanolind has been producing for a number of years from the shallow sands, has not had a deep test. Continental, joint with Stanolind and the Standard Oil Co. of Texas, is now drilling a deep test on the Bi-Clahbi-to dome in San Juan County. Amerada also has resumed investigations in northern Colorado where it was active in 1938, its crews working as far south from the Wyoming line as Boulder, Colo. At that time it took leases on a block of 3,660 acres around Clark's Lake, east of the Wellington field. Recently it was reported taking additional leases and also blocking up a structure in the same general area. Amerada drilled one deep test on the Wyoming side southwest of the recent Horse Creek discovery by General Petroleum Corp.

**MONTANA COMPLETIONS**

Cut Bank, Glacier County: R. A. Kulberg 1 Tribal-205, SE SW NE 25-32n-6w, T.D. 3,104 ft., 7-in. 3,064 ft., light show oil in Sunburst at 3,015-25 ft., Cut Bank 3,060-86 ft., main pay 3,075-86 ft., fluid rose 600 ft. in 24 hr., swabbed 25 bbl. in 24 hr. after standing 48 hr., then shot, now cleaning out.

Kevin-Sunburst, Toole County: Big West Oil Co. 22 Dahlquist, NE SE SE 21-35n-3w, T.D. 1,772 ft., contact 1,748 ft., break at 1,760-70 ft., shot, then acid. 1,000 gal., 75 bbl. per day.

Big West Oil Co. 21 Dahlquist, SE NE SE 21-35n-3w, T.D. 1,764 ft., contact 1,761-64 ft., 8 bbl. per day natural, will acidize later.

Texas Co. 11 Richard Davey, SW SW SW 3-35n-2w, T.D. 1,675 ft., 300,000 cu. ft. gas in Sunburst at 1,440-65 ft., contact 1,670-75 ft., acid. 500 gal., 150 bbl. oil and 3 bbl. water per day.

Midway, Pondera County: R. C. Tarrant 1 Anderson, C NE SE 26-28n-2w, T.D. 1,735 ft., top Sunburst 1,730 ft., show of oil followed by 1,000 ft. of salt water, plugged and abandoned.

**Lease sale, Northwest New Mexico.** The Department of the Interior has advertised a sale of a Navajo Indian lease on 3,360 acres on the Walker dome, McKinley County, New Mexico, at the Navajo Indian Agency, Window Rock, Ariz., on June 29. The land is located in Sections 2, 10, 12, 14, 22, 26 and 34-15n-10w. Lessor must agree to start a Pennsylvanian test to 7,000 ft. within 60 days after approval of the lease. The Mancos formation is at the surface and the deepest test went to the McElmo at 1,460 ft. Several shallow wells have shown some production in the Dakota.

**Lease sale on Bowdoin dome.** — A second sale of government leases on the Bowdoin structure in Phillips and Valley counties, Montana, since the unitization of the area as of February 4, 1942, will take place on July 8 at Great Falls, Mont., when 65 parcels will be offered. All leases must be made subject to the unit agreement and share in the cost and production. The structure is an enormous one containing around 100,000 acres, and the gas is developed at around 1,000 ft.

**Oil shale tests.** — President M. F. Coolbaugh, of the Colorado School of Mines, states that experiments will


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be started on a small scale at an early date at the school to determine the commercial possibilities of the immense deposits of oil shale in western Colorado.

## MICHIGAN

### Gas Discovery Reported In Newaygo County

SAGINAW, Mich.—Michigan's oil and gas development outlook was improved somewhat this week as the result of discovery of what looks to be another good gas field, a second oil producer confirming a small new pool and a continued call for new drilling permits.

Field reports for the week showed 15 completions, including three gas wells, five new oil wells and seven dry holes, six of which were wildcat operations. The state Conservation Department issued 15 new permits for tests in 11 counties.

Opening a new source of natural gas, Taggart Brothers Co. of Big Rapids brought in 1 Goodrich in Goodwell Township, Newaygo County, for about 10,500,000 cu. ft. a day. The well is 6 miles northeast of White Cloud and 15 miles west of the old Austin gas field. Resumption of operations by Taggart Brothers also resulted in two more producers in Clare County, one in Summerfield Township, the other in Winterfield. Their yields exceeded 4,000,000 cu. ft. each.

The wildcat oil producer also is in Newaygo County, and in Norwich Township. The producer, good for 210 bbl. a day after acidizing, is Ohio Oil Co. 1 Pillsbury, in Section 29. Best of the five new oil wells was Sun Oil Co. 2 Decker in Section 28, Osceola Township, Osceola County. It is in the Evart field and flowed 259 bbl. the first 14 hours.

The state Conservation Department offered oil and gas lease rights on 35,000 acres of state-owned land in 14 counties. Demand was good in most instances. State land under lease now totals 535,000 acres, having almost doubled in the past 18 months.

New permits raised the total for the year to 199. They provide for drilling operations as follows: Three in Clare County, two each in Newaygo and Van Buren, one each in Isabella, Clinton, Osceola, Roscommon, Berrien, Washtenaw, Mecosta and Missaukee.

**MICHIGAN COMPLETIONS**

Arenac County, Mason Township: Charles W. Teater 1 Walker, C S½ SW SW 10-20n-5e, wildcat, dry, T.D. 1,745 ft.

Clare County, Summerfield Township: Taggart Brothers Co. S-3 State-Miltner et al, C SW 6-20n-5w, 4,520,000 cu. ft. natural gas, T.D. 1,326 ft.

Winterfield Township: Taggart Brothers Co. S-4 Perrin et al, C NE 1-20n-6w, 4,170,000 cu. ft. natural gas, T.D. 1,323 ft.

Kalamazoo County, Alamo Township: N. Wagenaar & H. P. Alexander 1 Dobbin et al, NW SW SE 30-1s-12w, wildcat, dry, T.D. 1,300 ft.

Mecosta County: Fork Township: Gulf Refining Co. 1 Climer-State, C NW NE 7-16n-7w, flowed 324 bbl. naturally, T.D. 3,853½ ft.

Missaukee County: Aetna Township: C. L. Maguire, Inc., A-1 State-Aetna, C S½ NW SW 23-22n-6w, wildcat, dry, T.D. 3,960 ft.

Newaygo County, Goodwell Township: Taggart Brothers Co. G-1 Goodrich, SE SE SW 5-14n-11w, 10,400,000 cu. ft. natural gas, T.D. 1,180 ft.

Taggart Brothers Co. G-2 Olsen, E½ SW SE Sec. 16, wildcat, dry, T.D. 1,156 ft.

Norwich Township: Ohio Oil Co. 1 Pillsbury, C S½ SE NE 29-15n-11w, wildcat, 210 bbl., acidized, T.D. 2,864 ft.

Osceola County: Cedar Township: Sun Oil Co. 1 Beardsley et al, C S½ NW SW 27-18n-9w, dry, T.D. 3,797 ft., P.B. to 3,200 ft., acidized without result.

Ohio Oil Co. 2 Boettcher et al, C S½ SW SE Sec. 28, acidized for 40 bbl., estimated, T.D. 3,970 ft., P.B. to 3,402 ft.

Osceola Township: Sun Oil Co. 2 Decker, C N½ SE NW 28-18n-8w, 259 bbl. naturally first 14 hr., T.D. 3,766 ft.

Saginaw County, Jonesfield Township: H. C. Nelson 1 Reitz, C S½ SE NE 23-12n-1e, wildcat, dry, T.D. 3,379 ft.

Van Buren County, Bangor Township: Fisher-McCall Oil & Gas, Inc., 1 Wallace, NE NE SW 9-2s-16w, pumping 200 bbl. oil and salt water, acidized, T.D. 1,015 ft.

Covert Township: Homrich & Kendall 1 Spinder, SW SE NW 12-2s-17w, wildcat, dry, T.D. 1,018 ft.

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## SOUTHWEST TEXAS

### New Gas-Distillate Field Opened in Live Oak County

CORPUS CHRISTI, Tex.—Assurance of a new distillate field in Live Oak County was provided by a production test last week at Henderson Coquat 1 W. W. Goebel, 2½ miles northeast of Oakville. This wildcat, started last March as a Wilcox test and drilled to a total depth of 7,095 ft., flowed at an estimated rate of 100 bbl. daily through 2/8-in. choke at the top and ¼-in. choke at the bottom, from perforations at 6,970-82 ft. Two gas-distillate sands had been cored, and the test was made in the lower pay. An encouraging oil show was disclosed by a drill-stem test of a sand about 100 ft. deeper during drilling operations, and it is planned to make a test of this sand. The new field has been named Goebel by the nomenclature committee of the South Texas Geological Society. About 1½ miles east of the discovery well the same operator got a show of oil at his 1 M. Coquat while coring at 2,775 ft. and a gas sand at 2.540-60 ft.

**Hidalgo County.**—Sun Oil Co. has run into trouble at 1 Dee Davenport, 1½ miles southeast of Gateway, where about 4,000 ft. of drill stem stuck in the hole after twisting off a welded joint. Part of the stem has been cut out. The well is at 8,062 ft.

**Starr County.**—Sun 2-A F. Alvarado, 5 miles northeast of the Rincon field, is coring ahead after cleaning out the hole in which about 2,000 ft. of drill stem had stuck. Total depth of the well is 7,000 ft. W. L. Goldston et al 1 Alberto Gutierrez, a mile northwest of the Barbacoas field, was waiting on orders at 4,004 ft. Oil shows were reported.

**Jim Wells County.**—Humble Oil & Refining Co. 1 M. A. Evetts, 2 miles north of Magnolia City, perforated casing at 5,385-5,400 ft., swung 2-in. tubing at 5,365 ft., and sealed in casing with packer at 5,355 ft. At latest report the well was flowing gas, with a trace of distillate, through ⅛-in. choke, with tubing pressure of 2,000 lb. Testing continued. No shows had been reported by A. H. and C. L. Rowan 1 Fred Bagnall, 4 miles northwest of Bentonville. It was coring at 5,440 ft. in hard shale. Stanolind Oil & Gas Co. has staked location for 1 Dora Blake, 2½ miles west of Wadoto.

**Jim Hogg County.**—M. L. Massingill et al 1 R. Yeager, 5 miles south of Hebbronville, at total depth of 3,771 ft., made a 30-minute drill-stem test from 3,762-71 ft., with ¼-in. chokes at top and bottom. The well tested 16-lb. pressure and recovered 360 ft. of oil. Bottom-hole flowing pressure was 250 lb. and shut-in bottom-hole pressure 1,100 lb. The crew was waiting on orders.

**Karnes County.**—H. H. Howell has staked location for a wildcat test 1 J. Demmer, 3 miles northeast of Gillette. Materials are being moved in for 1 Banker, which Phillips Petroleum Co. will drill in the new Hondo Creek field, 2,000 ft. north of 1 Reasoner, the discovery well.

**SOUTH TEXAS COMPLETIONS**

**Wildcats**

Brooks County: Sun 2 Boedeker, 8 mi. N of Rachel, location abandoned.

Duval County: Cox & Hamon and Yoakum 1-B W. K. Hoffman, 4 mi. SE of Hoffman field, dry at 3,502 ft.

Live Oak County: Continental 2 A. W. West et al, 1 mi. SW of Oakville, dry at 2,676 ft.

Fidelity Oil & Royalty Co. 3 Reeves Brown, 3 mi. E of Mount Lucas field, dry at 4,712 ft.

Starr County: Baldridge & King 1 Laredo National Bank, Por. 80, Sur. A-74, dry at 1,189 ft.

**Fields**

Aviator, Webb County: Dulup Oil Co. 6 Puig Bros., Alberca de Arriba grant A-1996, dry at 1,865 ft.

Boyle, Starr County: Continental 1-I M. M. Garcia, Santiago Lopez Por. 92, 133 bbl. through ⅛-in. choke, T.P. 320 lb., C.P. 650 lb., gas-oil ratio 628, perf. 3,942-48 ft., T.D. 3,980 ft., P.B. 3,949 ft.

Glen, Webb County: O. W. Killam 5 A. M. Bruni, Las Albercas grant, dry at 3,288 ft.

North Sun, Starr County: Sun 4 C. Laurel, La Sal Colorado grant, 159 bbl. through 9/64-in. choke, T.P. 8,000 lb., C.P. 1,400 lb., gas-oil ratio 918, perf. 4,549-53 ft., T.D. 4,556 ft.

Strake, Duval County: Stanolind and Mills Bennett 4-A Farmers Life Insurance Co. B, S.A.&M.G.R.R. Sur. 2, A-527, dry at 3,220 ft.

**LOWER GULF COAST COMPLETIONS**

**Wildcats**

Bee County: Bridwell Oil Co. 1 D. Meyers estate, 1 mi. N of Beeville, dry at 3,864 ft.

Nueces County: W. A. Richardson Drilling Co. 1 Tally, 2 mi. S of Robstown, dry at 7,510 ft.

Victoria County: Arkansas Fuel Oil Co. 1

*(Continued on Page 109)*

### California Fields

*(Continued from Page 96)*

completed in Red Ribbon zone, Pliocene.

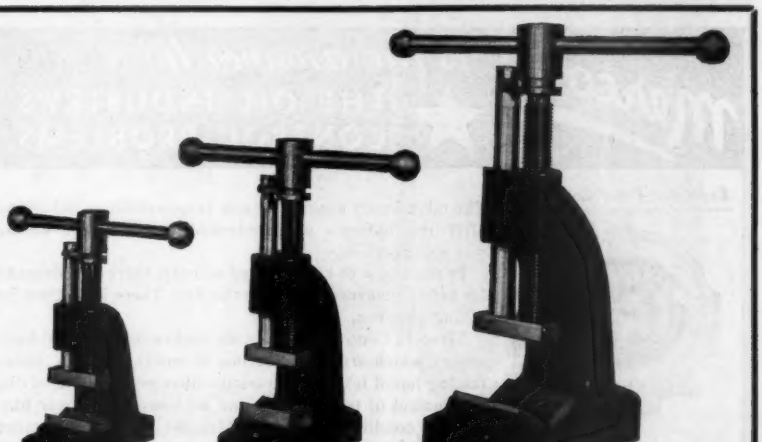
Kern Front, Kern County: Standard 26-5 fee, 5-28s-27e, pumped 167 bbl., 13.8-gravity, 7 per cent cut, T.D. 2,850 ft., 100-mesh perf. 2,663-2,848 ft., M point 2,474 ft., Q point 2,665 ft., R point 2,680 ft., S point 2,805 ft.

Standard 12-8 fee, 8-28s-27e, pumped 50 bbl. net, 11.8-gravity, 75 per cent cut, T.D. 2,900 ft., P.B. 2,839 ft., 100-mesh perf. 2,696-2,837 ft., M point 2,525 ft., N point 2,630 ft., Q point 2,711 ft., R point 2,795 ft., S point 2,872 ft., completed in Kern Front zone, Pliocene.

McClure Valley wildcat district, Kings County: Tide Water Associated 56 Orchard, 30-24s-18e, dry, T.D. 3,039 ft., Kreyenhagen 1,714 ft., Point of Rocks sand 2,117 ft., bottomed in gray sand.

Midway-Sunset, Kern County: C.C.M.O. Co. 57-9 fee, 9-32s-23e, pumped 10 bbl. net, 13.5-gravity, 50 per cent cut, T.D. 3,027 ft., P.B. 2,976 ft., perf. 2,483-2,975 ft., completed in Midway zone, Pliocene.

C.C.M.O. Co. 22-G, 27-31s-22e, dry, T.D. 3,590 ft.

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H. & T. Oil Co. 9 West Midway, 15-31s-22e, pumped 10 bbl., 13.6-gravity, 2 per cent cut, T.D. 1,368 ft., P.B. 1,260 ft., perf. 1,200-60 ft., completed in West Midway zone, Pliocene.

Honolulu Oil Corp. 8-A, 10-31s-22e, pumped 10 bbl., 12.5-gravity, 15 per cent cut, T.D. 923 ft., P. B. 581 ft., 250-mesh perf. 413-581 ft., completed in West Midway zone, Pliocene.

Otis Hoyt 11 Maricopa, 12-11n-24e, pumped 120 bbl. net, 12.8-gravity, 30 per cent cut, T.D. 1,824 ft., 100-mesh perf. 1,670-1,824 ft., completed in Midway-Sunset zone, Pliocene.

Richfield 9 Fairfield, 11-31s-22e, pumped 140 bbl., 17.9-gravity, 5 per cent cut, T.D. 1,301 ft., P.B. 1,230 ft., perf. 1,180-1,229 ft., completed in Midway-Sunset zone, Pliocene.

Riverdale, Fresno County: Amerada 2-15 Young, 15-17s-19e, flowed 246 bbl., 36.5-gravity, 0.1 per cent cut, 200,000 cu. ft. gas, 8/64-in. bean, pressures, 1,100/800 lb., T.D. 7,870 ft., perf. 6,800-75 ft., completed in Lawton zone, Miocene.

Round Mountain, Kern County: Honolulu 73 Round Mountain, 20-28s-29e, pumped 15 bbl. net, 28.9-gravity, 50 per cent cut, T.D. 1,960 ft., perf. 1,503-98 ft., 1,698-1,959 ft., completed in Vedder zone, Miocene.

Round Mountain wildcat district, Kern County: Signal Petroleum Co. 1 McGregor, 26-28s-28e, dry, T.D. 3,162 ft.

## COASTAL DISTRICT

**Ventura County.** — Shell Oil Co., Inc., has suspended drilling operations on 1 Tomson in the Rincon field at 9,704 ft. and may abandon owing to steep dips found during the last 200 ft.

On the Ramona anticline in Ventura County, Continental is still drilling ahead in 2 Holser after having had only minor showings in the upper zone.

Standard has spudded 1 Crestmont also on the Ramona anticline but it will be several weeks before anticipated productive levels are reached.

In the Shiells Canyon section of Ventura County, Seaboard has taken 1 Calumet off production and will deepen the hole in search of deeper pay. Standard will soon spud a new wildcat in the Fillmore district in 24-4n-20w. A derrick was erected several weeks ago. Many wells throughout the state are feeling the manpower shortage and waiting for crews is now the rule rather than the exception.

### COASTAL DISTRICT COMPLETIONS

Cat Canyon, Santa Barbara County: A. E. Bell Corp. 1 Gilmore, 23-9n-33w, abandoned as noncommercially productive, T.D. 6,457 ft.

Santa Maria Valley, Santa Barbara County: Pacific Central Oil Co. 1 Defense, 20-10n-34w, abandoned in Franciscan basement, T.D. 4,336 ft.

Union Oil Co. 16 Union Sugar, 19-10n-34w, pumped 31 bbl. net, 12.8-gravity, 30 per cent cut, T.D. 5,600 ft., perf. 5,437-5,596 ft., completed in Monterey, Miocene.

Union 17 Union Sugar, 19-10n-34w, pumped 10 bbl. net, 16.5-gravity, 6 per cent cut, T.D. 4,670 ft., perf. 4,524-4,668 ft., bottomed in basement, completed in Monterey, Miocene.

Ventura Avenue, Shell 160 Taylor, 21-3n-23w, flowed 1,002 bbl., 30.8-gravity, 2 per cent cut, 355,000 cu. ft. gas, 40/64-in. bean, pressures 150/600 lb., T.D. 9,610 ft., perf. 8,660-8,944 ft., 9,00-9,607 ft., completed in lower Lloyd zone, Pliocene.

# TEXAS GULF COAST

## Drilling Increases Around Edge of Katy Field

HOUSTON, Tex.—Further testifying to the widened interest in the Katy area, until a few months ago supposed to be a gas-distillate field only, Ray Ranger and Jack W. Frazier have started drilling a wildcat, 1 Burney estate, 3½ miles south of Katy, in the M.&C. Survey, Fort Bend County. The original Katy field lies in Waller and Harris counties. Stanolind Oil & Gas Co.'s discovery last March of 45.3-gravity oil at 6,622-25 ft., prior to that time an unexplored level, led to a flurry of new work, not only within the limits of the pool, but around its 45-mile perimeter. The Ranger-Frazier operation is the first of these to go over into Fort Bend County.

Kirby Petroleum Co. 1 Beckwith, about 2 miles southeast of Stanolind's discovery, the 1 Pattison, has established oil production in the North Katy area of Waller County, having gaged 208 bbl. of oil on a 24-hour test from 6,617-19 ft. Tide Water Associated Oil Co. has set pipe for completion of its 1 Stockpile, a southeastern offset to the 1 Pattison.

**Harris County.**—Testing continued at Cities Service Oil Co. 1 Witcher, 3 miles north of Alief. With perforations at 7,923-37½ ft., the well flowed 1.1 bbl. of oil and 0.28 bbl. of salt water an hour through ¼-in. choke, accompanied by a gas flow of 300,000 cu. ft. daily. Tubing pressure was 2,500 lb. A bottom-hole regulator was installed at 4,000 ft. Sun Oil Co. 1 Mansell, 2½ miles north of Katy, was drilling at 6,612 ft. in a salt-water sand. Cores showed slight oil odor.

**Matagorda County.**—Superior Oil Co. of California 1 Peterson, closely watched wildcat 3 miles northeast of Van Vleck, drilled out to 9,820 ft. after a squeeze job, and made a 4½-hour drill-stem test through perforations at 9,808-16 ft., with packer at 9,772 ft., ⅝-in. bottom choke and two 1-in. top chokes, and 480 ft. of water cushion. The well flowed slightly brackish water at the rate of 1,500 bbl. daily, with maximum pressure of 900 lb. Operator then pulled tool, set retainer at 9,780 ft. and squeezed; pulled retainer to 9,723 ft. and squeezed perforations; drilled out to 9,795 ft. and perforated casing at 9,765-70 ft. At latest report preparations were being made for another squeeze job. Stanolind 1 Pydus, southwest of Blessing, was drilling at 8,087 ft. in shale.

### TEXAS GULF COAST COMPLETIONS

**Wildcats**

Jackson County: Stanolind 1 Four Way Ranch, 3½ mi. SE of Maurbro, dry at 8,864 ft.

Jefferson County: Sun 1 Wilson-Bordages 3 mi. N of Beaumont, dry at 8,921 ft.

**Fields**

Camp Eleven, Tyler County: American Republics et al 1 Higgins fee, H. Higgins Sur. A-380, dry at 8,400 ft.

Dickinson, Galveston County: Bennett Oil Corp. 2 C. R. Crocker, W. K. Wilson Sur. A-208, O.W.W.O., old T.D. 8,841 ft., new P.B. T.D. 8,670 ft., 83 bbl. through ½-in. choke, input pressure 400 lb., perf. 8,625-35 ft.

Dyersdale, Harris County: Tide Water 2 Paul G. Roemer, W. Britton Sur. A-117, 72 bbl., pumping, gas-oil ratio 180, perf. 4,068-77 ft., T.D. 4,082 ft.

High Island, Galveston County: Stanolind 21 Cade, N. Fitzsimmons Sur. A-66, O.W.W.O., 96 bbl. through ⅛-in. choke. T.P. 160, gas-oil ratio 175, perf. 4,975-90 ft.

Lovell Lake, Jefferson County: Humble 44 Broussard Trust, C. Hillebrandt Sur., 130 bbl. through ⅛-in. by 6-in. chokes, T.P. 1,025 lb., gas-oil ratio 809, perf. 7,722-24 ft., T.D. 7,789 ft., P.B. 7,750 ft.

## Eastern Texas

*(Continued from Page 99)*

East Texas, Gregg County: East Texas Salt Water Disposal 2 Bryan Payne, T.D. 3,875 ft.

East Texas Salt Water Disposal 1 C. R. Starnes, 330 ft. from N, 280 ft. from E, 62.5-ac. tract, E. W. Walker lease, Martha Dillard Sur., T.D. 2,770 ft.

Rusk County: East Texas Salt Water Disposal 3 W. B. Key, 330 ft. from S and W, 42.7-ac. tract, O.W.D.D., old T.D. 3,721 ft., new T.D. 3,896 ft.

East Texas Salt Water Disposal 1 Jack Pugh, 200 ft. from N and W 5-ac. tract, Peter Holmes Sur., T.D. 3,952 ft.

Upshur County: East Texas Salt Water Disposal 1 K. Everett, 4,650 ft. from E, 175 ft. from S, William Goodwin Sur., T.D. 3,884 ft.

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## N. CENTRAL TEXAS

# Archer County Wildcat Has Saturation in Caddo Lime

WICHITA FALLS, Tex. — Frank Buttram 1 John F. O'Donohoe, Section 104, A.T.N.C.L. subdivision, 7 miles southeast of Mankins, Archer County, topped Caddo lime at 4,747 ft., showing oil to 4,749 ft., and carrying saturation from 4,749-64 ft. It was decided to carry the hole to contract depth 5,000 ft., however, before making a test. Less than a mile northeast of this well, Gulf Oil Corp. 1 Parish et al is a new wildcat location, now getting under way. It is located 1,980 ft. from north and west lines Section 97, A.T.N.C.L. subdivision, and is scheduled to go to 5,500 ft.

**Wilbarger County:** British-American Oil Producing Co. 1 Cora Wilkinson, Section 103, Waggoner Colony subdivision, flowed 53 bbl. in 2½ hours through open tubing and died. After being shut in 12 hours, it flowed 46 bbl. in 9 hours through ¼-in. choke on tubing. Then flowed 8 bbl. in 5 hours through ⅛-in. choke. On next 24-hour gage it flowed at the rate of 12 bbl. per hour through ¼-in. choke with constant casing pressure of 529 lb. and tubing pressure of 37 lb. After being shut in for 26 hours, it flowed 45 bbl. in 1½ hours and died; pumping unit was set. It is producing from perforations 5,780-90 ft. and 5,845-63 ft. and has been acidized with 2,500 gal.

**Cooke County.**—Snuggs, Seitz & McElreath 1 Percy McGeorge, promising pool opener from Strawn sand, 1 mile south of Walnut Bend pool, showed water through perforations 4,286-4,302 ft., and squeezed off perforations to reperforate. Benson Brothers 1 J. H. Cooke, 330 ft. from southerly north line, 330 ft. from east line, 329.78-ac. lease in A. Patterson Survey, 8 miles northwest of Muenster, is a new wildcat location for 1,900-ft. rotary test.

### NORTH TEXAS COMPLETIONS

**Wildcats**

Clay County: Sussex Oil 2 M. Chapin, Blk. 81, Byers Bros. subd., dry, T.D. 1,365 ft.

W. H. Spradling 1-A Mrs. J. P. Sunday, W. F. Young Sur. A-744, dry, T.D. 1,145 ft.

Wichita County: Bridwell Oil 1 J. Cabe, J. Cole Sur. A-37, dry, T.D. 2,014 ft.

J. C. Johnson 1 N. L. Lawrence, Sec. 27, Tarrant County School Land Sur., pump 15 bbl., sand pay 640 ft., T.D. 643 ft. Discovery.

Young County: Cochran & Cain 1 Hearne est., Sec. 3, B.B.B.&C. Ry. Sur., dry, T.D. 651 ft.

**Fields**

Archer County: C. G. Butts 2 J. T. Richardson est., M.E.P.&P. Ry Sur. A-715, dry, T.D. 1,265 ft.

Brockman, Throckmorton County: A. R. Matthews et al 3 C. T. Brockman, SE SW Sec. 94, Comanche Indian Reserve, dry, T.D. 716 ft.

Consolidated-Ellenburger, Wilbarger County: Consolidated Oil 1-D Geo. B. Ancell, Jr., 330 ft. from N and E, SW NE Sec. 2, Blk. 7, H.&T.C. Ry. Sur., flow 522 bbl., Ellenburger lime pay 4,266 ft., acid 3,000 gal., T.D. 4,290 ft.

Cooper, Archer County: G. W. Gooper 2 Perkins & Cullum, 660 ft. from S & E. Sec. 69, K.W.V.F.L. Sur., I.P. 133 bbl., lime pay 4,919 ft., T.D. 4,959 ft.

Daws, Young County: Standard Oil Co. of Texas and Hanlon-Buchanan 1-5 J. W. Daws, 1,400 ft. from S, 467 ft. from E, Sec. 1676, T.E.&L. Sur., dry, T.D. 3,894 ft.

East Bryson, Jack County: P. P. Steed 2 G. L. Jones, 494 ft. from N, 467 ft. from W, 80-ac. lease, J. H. Nessmith Sur., dry, T.D. 3,300 ft.

Hull & Silk, Archer County: Ligon Oil 2-A T. J. Moss, Sec. 1, H.T.&B. Sur., I.P. 180 bbl. oil, 20 water, perf. 24 shots 3,985-93 ft., O.T.D. 4,350 ft., P.B. to 3,993 ft.

K.M.A.-Ellenburger, Wichita County: E-C Oil 6-E G. W. Lewis, "A," 660 ft. from


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S, 330 ft. from W, Blk. 20, K.W.V.F.L. Sur., flow 665 bbl., Ellenburger pay 4,239 ft., T.D. 4,279 ft.

Scotland, Archer County: Shell Oil 8-C W. M. Coleman, 660 ft. from N, 580 ft. from W, Lot 1, Blk. 79, A.T.N.C.L. Sur., I.P. 86 bbl. oil, 12 water, lime pay 5,128 ft., T.D. 5,182 ft.

Talbot, Young County: Talbot & Schmitz 5 Pauline Ferguson, 1,440 ft. from S, 950 ft. from E, S. Tynes Sur., pump 35 bbl., sand pay 3,402 ft., T.D. 3,428 ft.

Vogtsberger, Archer County: Fain & McGaha 1-B E. Thorman, 467 ft. from N, 495 ft. from E, S 110 ac. SW¼ Sec. 11, Blk. 1, H.&T.C. Ry. Sur., Caddo 5,124 ft., S.O. 5,128-36 ft., Ellenburger 5,287 ft., dry, T.D. 5,387 ft.

Wichita County: Bourbon Royalty 1 L. N. Lockridge, A. L. Netherly Sur. A-240, dry, T.D. 1,799 ft.

**WEST CENTRAL TEXAS COMPLETIONS**

**Wildcats**

Fisher County: Humble Oil & Ref. 1 S. A. Willingham, NE NE Sec. 43, Blk. 3, H.&T.C. Ry. Sur., elev. 2,053 ft., Wolfcamp 3,010 ft., Swastika 4,420 ft., dry, T.D. 6,143 ft.

Hunter & Hunter 1 H. T. Fillingim, NW SW Sec. 112, Blk. 3, H.&T.C. Ry. Sur., dry, T.D. 4,506 ft.

Jones County: Harry Hines 1 B. A. Stephenson, NW NW SW Sec. 7, Blk. 16, T.&P. Sur., dry, T.D. 2,195 ft.

**Fields**

Eliasville, Stephens County: Christie Bros. 1 W. W. Cunningham, Blk. 1210, T.E.&L. Sur., dry, T.D. 4,380 ft.

Strand, Jones County: Ungren & Frazier 1 Hazel Strand, 510 ft. from N, 810 ft. from E, S½ SW Sec. 5, Blk. 5, H.&T.C. Ry. Sur., flow 257 bbl., lime pay 3,462 ft., T.D. 3,463 ft.

## Southwest Texas

*(Continued from Page 105)*

E. Terrell, 3 mi. W of Terrell field, dry at 5,411 ft.

**Fields**

Baldwin, Nueces County: Magnolia 6 J. C. Baldwin, B.S.&F. Sur. 165, 80 bbl. through 9/64-in. choke, T.P. 740 lb., gas-oil ratio 1,400, T.D. 6,707 ft.

Odem, San Patricio County: Seaboard 9-B J. F. Welder, Julian de la Garza Sur. A-8, 43 bbl. through 7/64-in. choke, T.P. 1,275 lb., C.P. 1,650 lb., gas-oil ratio 7,744, perf. 5,439-45 ft., T.D. 5,548 ft.

Richard King, Nueces County: Southern Minerals 6-C Richard King, Agua Dulce grant, 73 bbl. through 3/32-in. choke, T.P. 825 lb., C.P. 1,150 lb., gas-oil ratio 836, perf. 5,330-40 ft., T.D. 5,619 ft.

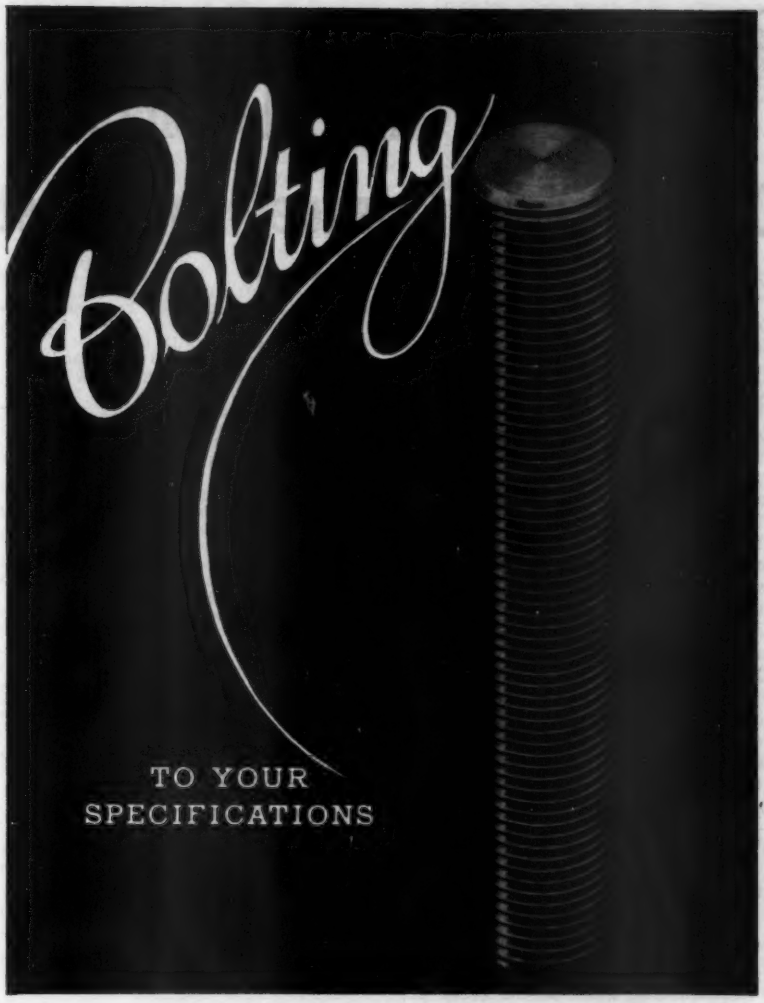
Seeligson, Jim Wells County: Magnolia 44 A. A. Seeligson, Los Jaboncillos grant, 108 bbl. through 7/64-in. choke, T.P. 875 lb., C.P. 1,400 lb., gas-oil ratio 680, perf. 5,215-18 ft., T.D. 6,850 ft.

Premont Development Co. 1 Premont Unit 1, B.S.&F. Sur. 361, A-70, perf. 6,060-95 ft. (zone 19), 134 bbl. through 7/64-in. choke, T.P. 1,200 lb., gas-oil ratio 607, perf. 5,249-60 ft. (zone 14), 140 bbl. through 7/64-in. choke, C.P. 610 lb., gas-oil ratio 421, T.D. 6,434 ft., P.B. 6,110 ft.

Transwestern 8-B Seeligson estate, H. D. Koopman Sur. 235, A-276, 94 bbl. through 3/32-in. choke, T.P. 100 lb., C.P. 1,200 lb., gas-oil ratio 777, T.D. 6,252 ft.

## PAW Revokes Directive 57

WASHINGTON, D. C.—The Petroleum Administration for War has revoked Directive 57, governing use of tank cars in midwestern and southwestern states, because Directives 65 and 67 recently issued divide these states into supply and distribution zones.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# Brush Creek Gas Field, Morgan County, Ohio, Extended Southwest

ZANESVILLE, Ohio.—The Brush Creek field was extended ½ mile to the southwest by the Industrial Gas Co. Eppley well in York Township, Morgan County, which gaged 2,700,000 cu. ft. The Hinckley pool of Medina County was also extended ½ mile to the southwest by the Belmont Quadrangle Cleveland Met. Park well having a volume of 780,000 cu. ft. The Ohio Fuel extended the Pittsfield pool ½ mile to the east by the completion of the Stoddard well, gaging 2,260,000 cu. ft. A new Clinton gas pool was discovered by the Ohio Fuel in Mohican Township, Ashland County, by the completion of the Metcalf well in Section 21, gaging 1,070,000 cu. ft. of gas a day. J. B. Orndoff completed a wildcat on the Schwaertzel farm in Section 15, Bearfield Township, Perry County, finding 311,000 cu. ft. in the Medina formation at 3,936 ft.

### OHIO COMPLETIONS

Ashland County, Mohican Township: Ohio Fuel 1 Howard Metcalf, Sec. 21, Clinton, 1,070,000 cu. ft., T.D. 2,959 ft.

Athens County, Carthage Township: C. W. Nuzum 5 Jas. R. Fish, Sec. 35, Cow Run, dry, T.D. 546 ft.

C. N. Nuzum 6 Jas. R. Fish, Sec. 35, Cow Run, dry, T.D. 580 ft.

Lodi Township: H. B. Walker 1 E. J. Howard, Sec. 3, Maxon, 163,000 cu. ft., T.D. 1,072 ft.

York Township: Porter et al 2 J. A. Harrold, Sec. 36, Berea, dry, T.D. 831 ft.

Knox County, Butler Township: Upham Gas 3 T. L. Ferenbaugh, Sec. 7, Clinton, dry, T.D. 2,961 ft.

Monroe Township: H. E. Perkins 2 Blanche Young, Sec. 25, Clinton, dry, T.D. 2,340 ft.

Lake County, Painesville Township: Diamond Alkali 1 fee, Clinton, dry, T.D. 3,025 ft.

Lorain County, Pittsfield Township: Ohio Fuel 3 Hannah Stoddard, Lot 160, Clinton 2,260,000 cu. ft., T.D. 2,282 ft.

Medina County, Hinckley Township: Ohio Fuel 1 Leon Searles, Lot 33, Clinton, 1,040,000 cu. ft., T.D. 3,526 ft.

Belmont Quadrangle 5 Cleveland Met. Park, Lot 88, Clinton, 780,000 cu. ft., T.D. 3,286 ft.

Meigs County, Salem Township: Taylor et al 1 C. P. Darst, Sec. 12, Keener, dry, T.D. 920 ft.

Monroe County, Malaga Township: H. S. Shafer 2 J. B. Haren, Sec. 3, Berea, dry, T.D. 2,095 ft.

Summit Township: Frank Greenbank 2 A. C. Weber, Sec. 23, Keener, dry, T.D. 1,385 ft. (drilled deeper).

Wayne Township: Decker and Paulis 4 D. S. Christman, Sec. 22, Berea, 120,000 cu. ft., T.D. 2,045 ft.

Morgan County, York Township: Ohio Fuel 1 C. L. Weaver, Sec. 35, Berea, 73,000 cu. ft., T.D. 1,170 ft.

Industrial Gas 1 H. Eppley, Sec. 34, Clinton, 2,700,000 cu. ft., T.D. 4,353 ft.

Noble County, Center Township: Ray Hogue 5 O. E. Heiszler, Sec. 23, Buel Run, dry, 142 ft.

Perry County, Bearfield Township: J. B. Orndoff 1 Andrew Schwaertzel, Sec. 15, Medina, 357,000 cu. ft., T.D. 3,939 ft.

Clayton Township: Preston Oil 2 Chas. A. Guest, Sec. 7, Clinton, 21 bbl., T.D. 3,251 ft.

Hopewell Township: Industrial Gas 1 J. S. Stalter, Sec. 34, Clinton, 536,000 cu. ft., T.D. 2,990 ft.

Jackson Township: Kissling Drlg. 1 Thos. Ferguson, Sec. 35, Berea, 311,000 cu. ft., T.D. 876 ft.

Thorn Township: Ohio Oil 2 E. R. Foucht, Sec. 13, Newburg, 400,000 cu. ft., T.D. 2,925 ft.

### EASTERN KENTUCKY

ASHLAND, Ky.—The eastern Kentucky spotlight shifted to Rowan County this week with the announcement that the Gulf Oil Corp. had started drilling on the first of 14 test wells on a tract of about 60,000 acres. The tract was said by several Ashland oil men to be east of Morehead, the county seat.

This is the first drilling of any importance in Rowan County in a number of years and while information was not available here it is thought that leasing has been quite thorough as indicated by the size of the tract.

Officials of the company have announced that the test wells will go to a depth of about 1,000 ft.

Five gas wells were completed and a dry hole reported by the Kentucky-West Virginia Gas Co. as follows with one of the wells an exceptional producer:

Johns Creek, Pike County: 715 J. A. Scott, T.D. 3,400 ft., shale, 1,077,000 cu. ft. gas, open flow, after shot.

Island Creek: 5292 G. W. Carroll, O.W. D.D., new T.D. 3,429 ft., 47,000 cu. ft. gas, open flow from Berea and 94,000 cu. ft. from Maxon.

Lower Pompey Branch: 5406 John Blevins, T.D. 3,820 ft., dry.

Daniels Creek, Johnson County: 5445 Allen C. Wells, T.D. 2,630 ft., shale, 231,000 cu. ft. gas, open flow after shot.

Little Mud Creek, Floyd County: 5447 J. H. Akers, T.D. 3,063 ft., shale, 958,000 cu. ft. gas, open flow, after shot.

Jones Fork, Knott County: 5449 Gilbert Martin, T.D. 2,560 ft., 174,000 cu. ft. gas, open flow, shale, after shot and 30,000 cu. ft. open flow from Big lime.

### WESTERN KENTUCKY COMPLETIONS

Union County: Sun 1 C. T. Newman, dry at 1,475 ft.

Henderson County: Carter Oil 1 Willett-Moore, dry at 2,633 ft., Menard 1,678 ft., Vienna 1,852 ft., Glen Dean 1,953 ft., Golconda 2,119 ft., Barlow 2,216 ft., Renault 2,394 ft., Ste. Genevieve 2,497 ft., St. Louis 2,616 ft.

W. F. Lacy 1 Sherrill, wildcat, dry at 2,540 ft., Menard 1,580 ft., lower Menard 1,678 ft., Glen Dean 1,884 ft., Barlow 2,152 ft., Ste. Genevieve 2,432 ft.

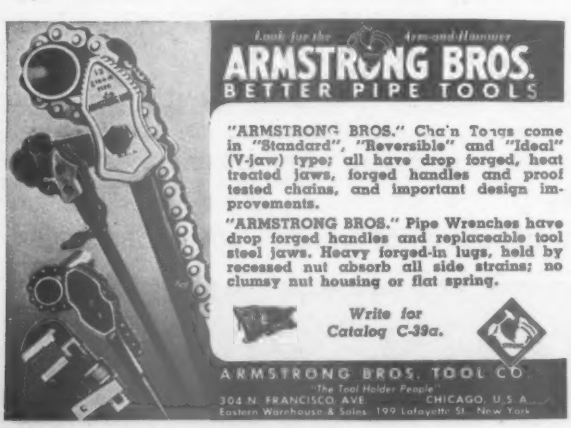
Smith Mills area: Farm Bureau et al 12 C. D. Burbank, pumped 250 bbl., McClosky pay 2,619-23 ft., T.D. 2,725 ft.

Daviess County: Robert A. Reilly 1 Prudential Ins. Co. (wildcat), 1½ miles south of Newman, dry at 2,018 ft., Chester-Kincaid 970 ft., Menard 1,132 ft., lower Menard 1,185 ft., Vienna 1,294 ft., Glen Dean 1,398 ft., Golcona 1,506 ft., Barlow 1,620 ft., Paint Creek 1,696 ft., Renault 1,746 ft., Ste. Genevieve 1,816 ft.

Webster County: Sinclair Prairie 1 T. S. Cavanaugh, 2 mi. E of Poole, dry at 2,795 ft., Glen Dean 2,007 ft., Barlow 2,263 ft., Renault 2,471 ft., Ste. Genevieve 2,543 ft.

### INDIANA COMPLETIONS

Gibson County: R. D. Brown 1 J. F. Lehman, NE SW. NE 36-1s-10w, dry at 1,806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ft., McClosky lime at 1,748-58 ft. and 1,764-70 ft.

Posey County: Felix Jablonski 1-A Renwick Properties, SE SW SW 1-7s-12w, dry at 1,929 ft., show of oil and water at 1,922-29 ft.

Wayne County: Wayne County Producers 1 P. McGaw C E½ SE NE 34-13n-1w, dry at 1,277 ft., top of Trenton lime 1,076 ft.

## LOUISIANA GULF

### Deep Leonville Wildcat Still Testing

NEW ORLEANS, La.—Eventual outcome of J. S. Abercrombie et al 1 Charles-Unit 2, 2 miles southwest of Leonville, in St. Landry Parish, was still a matter of speculation as the week closed. With perforations at 9,695-9,725 ft., the well kicked and swabbed brackish water, with a show of gas. It was planned to squeeze and perforate at approximately 9,625-40 ft. The operators say they are interested in testing the sand at approximately 9,500 ft.

Along with completion by Humble Oil & Refining Co. of its 1 Colonial Sugars Co., 5-12s-5e, in the Hester-Convent area of St. James Parish, it is reported that the crude produced by this well is of the most excellent quality found in the state. Initial yield s 91 bbl. of 38.7-gravity oil through 9/64-in. choke. The oil is of high-octane gasoline content and of superior grade for lubricant manufacture.

**Acadia Parish.**—Sun Oil Co. and Standard Oil Co. of Ohio shut in their wildcat 1 J. R. Daily et al, 7 miles west of Crowley, after completing it at total depth of 11,199 ft., plugged back to 10,660 ft. On potential test the well flowed at the rate of 105 bbl. of distillate daily through $\frac{7}{64}$-in. choke, along with 3,550,000 cu. ft. of gas. Operators were unable to kill the well to test a higher sand section at approximately 10,100 ft.

**Terrebonne Parish.** — Preparations were being made to begin testing operations at Union Producing Co. et al 1 Fitzpatrick-Vizard, 77-19s-17e, in the De Large field, which may establish a world record for deep production. Fohs Oil Co., whose 1 Buckley-Bourg, in the same area, holds the record now, is associated with Union in the 1 Fitzpatrick-Vizard, which is bottomed at 13,560 ft. The Buckley-Bourg flows from 13,266 ft. A sand section topped just above 13,500 ft. was to be tested in the Fitzpatrick-Vizard. No oil shows were reported at Humble 2-B Continental Land & Fur Co., 12 miles southeast of Morgan City, which was at 11,185 ft. in sandy shale and coring.

**Beauregard Parish.**—Sohio Producing Co. has staked a 12,000-ft. wildcat test, 1 Lutcher-Moore Lumber Co., in 34-6s-12w, 1¾ miles west of production. Phillips Petroleum Co. 1 First National Bank of Beaumont, east of the discovery well in the new Bear pool, flowed at the rate of 150 bbl. daily through 9/64-in. choke from perforations at 6,514-18 ft., with tubing and casing pressures equalized at 1,000 lb. Total depth is 6,569 ft.

**LOUISIANA GULF COAST COMPLETIONS**

**Wildcats**

Acadia Parish: Sun and Standard of Ohio 1 J. R. Daily et al 31-9s-1w, 105 bbl. distillate and 3,550,000 cu. ft. gas through $\frac{7}{64}$-in. choke, T.P. 3,640 lb., C.P. 50 lb. (packer leaking), gas-oil ratio 33,800, T.D. 11,199 ft., P.B. 10,660 ft. Discovery

**Fields**

Avery Island, Iberia Parish: Humble 2 Petit Anse Co., 25-13s-5e, O.W.W.O., old T.D. 9,242 ft., new T.D. 8,991 ft., 180 bbl. through ⅛-in. choke, T.P. 1,400 lb., gas-oil ratio 467, perf. 8,975-90 ft.

Bayou Choctaw, Iberville Parish: Solvey Process Co. 3 Wilbert (salt test), 52-9s-113, dry 1,772 ft.

Belle Isle, St. Mary Parish: Sun 3 Belle Isle Corp., Bay-19s-10e, dry at 4,096 ft.

Chacahoula, La Fourche Parish: Sun 2 SWD Cypress, 75-15s-15e, completed as salt-water disposal well, T.D. 701 ft.

Sun 2 SWD Dibert, Stark & Brown Cypress Co., 76-15s-15e, completed as salt-water disposal well, T.D. 1,005 ft.

Convent, St. James Parish: Humble 1 Colonial Sugar Co., 5-12s-5e, 91 bbl. through 9/64-in. choke, T.P. 1,650 lb., gas-oil ratio 5,660, perf. 5,342-45 ft., T.D. 7,692 ft., P.B. 7,144 ft.

Garden Island Bay, Plaquemines Parish: Texas 61 State-Garden Island Bay, 108-23s-32e, dry at 4,317 ft.

Tepetate, Acadia Parish: Falcon-Seaboard Drilling Co. 1-B D. J. Miller, 28-7s-2w, dry at 9,337 ft., P.B. 9,060 ft.


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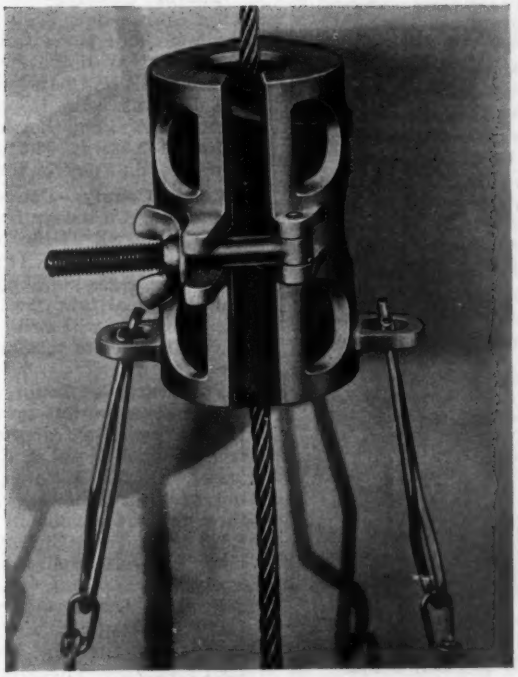

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# OKLAHOMA

## Hunton Lime Objective Spurs Lease Play

THE main interest in Oklahoma centers around the active lease play started by the Hunton lime discovery at West Edmond. The Hunton zone borders the west side of the Oklahoma field and is thought to be in a trend running from West Edmond, Ace Gutowsky and D. D. Bourland's well in 32-14n-4w, south of the South Canadian River in Cleveland County. The first wildcat on this trend is the Mid-Continent Petroleum Co. 1 Harris, NE SE SW 29-10n-3w, about 3 miles southwest of the town of Moore in Cleveland County. Operators were moving in the rig last Saturday. It will go to the Wilcox.

**Garvin County.**—Amerada Petroleum Corp.'s deep well north of the shallow Robertson pool was to be abandoned at 10,996 ft. The well, 1 House in SE NW 2-1n-3w, found Hunton lime at 9,515 ft., and Viola at 10,016 ft. A slight showing of oil was found at 5,025 ft. The company had hoped to find pay in the Ordovician.

**Caddo County.**—Denver Producing & Refining Co.'s deep test, the 1 Sah-Cam in SE SE 33-10n-10w, was last reported drilling at 11,900 ft., with considerable gas bubbling through the mud. Original total depth was 13,842 ft. Operators will drill back to the 13,000-ft. level to test saturated sand found there.

**Pottawatomie County.**—A ¾-mile southeast extension to the McComb Hunton pool was reported last week when Stanolind Oil & Gas Co. 1 Atwater, SE NE 34-8n-3e, flowed 138 bbl. of oil in 21 hours, with no water, through perforations in the lime at 4,628-40 ft. Additional shots will be made higher in the zone before acidizing.

**Pawnee County.**—Continental Oil Co.'s first completion across the Arkansas River in the East Watchorn pool found the Wilcox dry at 3,865 ft. Drilling stopped at 3,876 ft.

### OKLAHOMA COMPLETIONS

**Wildcats**

Carter County: Stanolind 1 Sarasota, NE NE NE 18-5s-1w, dry, T.D. 4,949 ft., Viola 4,860 ft., Trenton 4,920 ft.

Cleveland County: H. L. Berkey 1 Schultz, NE NE 5-10n-1w, dry, T.D. 6,945 ft., Oswego 6,015 ft., base Pennsylvanian and top Hunton 6,300 ft., Viola 6,655 ft., dolomite 6,730 ft., second Wilcox 6,929 ft.

Lincoln County: Portable Drlg. 1 Barnes, SW SE 19-13n-5e, dry, T.D. 5,001 ft., Hunton 4,771 ft., Viola 4,870 ft., Wilcox 4,947 ft., second Wilcox 4,993 ft., perf. 3,643 ft. in Oswego and swabbed 12 bbl. oil and 385 bbl. water.

Logan County: Continental Oil 1 Clark, SW SW NW 17-16n-1e, dry, T.D. 5,922 ft., sand 5,277 ft., Misener 5,512 ft., Hunton 5,517 ft., Viola 5,645 ft., second Wilcox 5,893 ft.

Oklahoma County: C. C. Peppers 1 Britton, NW SE 33-13n-3w, pumped 27 bbl., dolomite 6,700-18 ft., T.D. 6,930 ft.

Payne County: T. N. Berry 1 Sherrill, SW SE SE 5-18n-4e, 2,000,000 cu. ft. gas, 1,240 lb. R.P., second Wilcox 4,160-65 ft., T.D. 4,203 ft.

Pottawatomie County, old well reworked: Smith Bros. 1-B Brundage, NE NE SE 6-7n-4e, pumped 75 bbl., old T.D. 3,993 ft., ripped casing and shot in Earlsboro 3,853-63 ft.

Seminole County: Russell Pet. 1 Whitney, E½ SE SE 7-10n-6e, dry, T.D. 3,584 ft., Booch 3,254 ft., Cromwell 3,538 ft.

**Fields**

Cumberland. Marshall County: Pure 7 Chrisman-104, SE NE NE 29-5s-7e, flowed 423 bbl. in 4 hr., pay 5,770-5,873 ft., T.D. 5,878 ft.

Liberty, E., Noble County: Fred Ptak 1 Jensen, SE SW SW 3-22n-2e, dry, T.D. 4,385 ft., Wilcox 4,358 ft.

Lincoln County: Danciger 1-A Estes, SE SW SE 30-17n-4e, flowed 85 bbl. through choke, Wilcox 4,501-21 ft.

Logan County: Gulf 1 Stoner, SE SW SW 16-16n-4w, flowed 10 bbl., Layton 5,216-46 ft., T.D. 5,257 ft.

March, Payne County: Home Gas 1 Thompson, SE SE SE 31-18n-5e, dry, T.D. 3,622 ft., Skinner sand 3,425 ft.

Home Gas 1 Lamson, SE SW SW 32-18n-5e, pumped 100 bbl., sand 3,569-3,607 ft. T.D. 3,709 ft.

Pauls Valley, Garvin County: Texas, Continental and Pure 1-B Patchell, SE SW SE 25-4n-1w, flowed 465 bbl. through ¼-in. choke, 4,500,000 cu. ft. gas, pay 3,970-4,040 ft.

Watchorn, E., Pawnee County: Continental No. 2, SW NW NW 24-23n-3e, dry, T.D. 3,876 ft., Wilcox 3,865 ft.

Wewoka Townsite, Seminole County: Jordon Pet. 1 Youngblood, SE SE SW 8-8n-8e, pumped 414 bbl., dolomite 4,215-19 ft., T.D. 4,270 ft.

**Miscellaneous**

Creek County: Dunn-Miller 1-A Ferrell, SE NW NW 26-14n-10e, dry, T.D. 3,347 ft.

Seismograph Service 1-A Belford, SE SW SE 26-15n-10e, dry, T.D. 3,032 ft.

Sinclair Prairie 50 Berryhill, NE NE 16-17n-12e, pumped 20 bbl., T.D. 1,595 ft.

Sinclair Prairie 51 Berryhill, W½ NE NE 16-17n-12e, pumped 12 bbl., T.D. 1,583 ft.

Gulf 19 Barnes, NE NE SW 8-17n-12e, pumped 8 bbl., T.D. 1,705 ft.

Hughes County: Aylward & Hinkle 1 Richards, NE NW 29-6n-8e, dry, T.D. 2,781 ft.

Osage County: Powers & Quinlan, SE NE NW 26-24n-8e, pumped 50 bbl., Bartlesville 2,258-2,307 ft.

Barnsdall No. 9, SE SW NE 23-24n-9e, dry, T.D. 2,291 ft.

Cities Service No. 492, NE NE SE 36-26n-9e, 2,500,000 cu. ft. gas, sand 1,788-1,800 ft.

Cities Service No. 493, SE NW NE 25-23n-11e, 500,000 cu. ft. gas, sand 1,761-71 ft.

Seminole County: Sinclair Prairie 2 Nevins, NW SE NW 5-9n-6e, pumped 22 bbl., Hunton 4,110-75 ft., T.D. 4,364 ft.

## Appalachian

*(Continued from Page 100)*

Meade district: Cumberland & Allegheny Gas Corp. 336 Coleman Alkire, 45,960 cu. ft. gas, Bull Town sand, T.D. 4,090 ft.

Cumberland & Allegheny Gas Corp. 341 W. W. Elmer, 1,778,200 cu. ft. gas, Fourth sand, T.D. 2,305 ft.

### ORISKANY GAS FIELDS

Jackson County, Ripley district: West Virginia Gas Corp. 1 E. L. Wolfe, 5,015,000 cu. ft. gas, Big lime 1,950 ft., Corniferous lime 5,033 ft., Oriskany 5,125-59 ft., T.D. 5,159 ft.

Washington district: United Fuel Gas Co. 5114 J. W. Scarberry, 1,364,000 cu. ft. gas, Corniferous lime 4,834 ft., Oriskany 4,932-82 ft., shot 4,938-70 ft., T.D. 4,985 ft.

## ILLINOIS FIELD REPORT

# Search for New Pools and New Pays in 9 Counties

MATTOON, Ill.—Ten new oil wells and 13 dry holes were recorded in the past week in the Illinois fields. Twenty-four new operations were started in the state including nine wildcats as follows: Shell 1 Thropp, SW SW NW 29-1n-12w, Wabash County; Ryan & Fortner 1 Ralston, E½ SW SE 9-1n-10e, Edwards County; E. M. Heath 1 J. F. McMillan, C SE SW 22-6n-3e, Fayette County; Sinclair-Wyoming 1 Hinterscher, C NE SE 4-4n-8e, Clay County; T. C. Eason et al 1 L. Mayer, SE NW SW 15-4n-6w, Madison County; Black & Pearson 1 H. Kluth, SW SW SW 22-2n-1w, Clinton County; Roy Wilson et al 1 Richards, N½ SE SW 13-1n-6e, Wayne County; W. H. Carraker 1 General American Life, S½ NE NW 36-5s-6e, Hamilton County; Sohio Producing 1 O. D. Flatt, NW NW SE 19-6s-2e, Franklin County.

In the Boulder pool in Clinton County, where the Devonian lime has been yielding good production in a few wells, H. A. Harmon 1 Volkamp, C NE SW 1-2n-2w, topped Devonian at 2,758 ft. and drilled to 2,840 ft. where, after an electrical test, it was shut down for owner's orders.

In the North Sims pool, Wayne County, Texas 6 Tolbert, NE NE NE 17-1s-6e, was bottomed at 3,174 ft., with salt water in McClosky lime. Levias lime (lower O'Hara) will be tested through perforated pipe.

In the Walpole pool in Hamilton County, Texas 1 F. Johnson, NW NW NE 27-6s-6e, swabbed 238 bbl., 191 bbl. and 260 bbl. of oil on successive days at a total depth of 3,113 ft. and was still testing.

L. L. Waggoner et al 1 John Pilcher, C SW NW 13-5n-5e, a wildcat east of the Iola pool in Clay County, was being put on the pump. It swabbed 176 bbl. a day through tubing. Total depth 2,458 ft.

### ILLINOIS COMPLETIONS

#### Wildcats

Bond County: Louis Lilly et al 1 Martin, SE SW SE 22-4n-2w, dry at 1,267 ft., Glen Dean 946 ft., Golconda 990 ft., Cypress 1,081 ft., Weller 1,114 ft., Paint Creek 1,190 ft.

Edwards County: Olson Oil 1 J. H. Felix, NW NW SW 31-1s-10e, dry at 3,450 ft., Weller 2,968 ft., Paint Creek lime 3,120 ft., Paint Creek sand 3,137 ft., Benoist 3,205 ft., lower Renault 3,248 ft., Aux Vases 3,253 ft., Ste. Genevieve 3,304 ft., lower O'Hara 3,341 ft., Fredonia 3,361 ft., McClosky 3,384-88 ft.

Franklin County: Ohio Oil 1 U. S. Coal & Coke, NE NE NW 13-6s-3e, north of the Benton pool, pumped 80 bbl. oil and 44 bbl. water, Levias lime at 2,894-2,904 ft. and Rosiclare 2,944-48 ft., T.D. 3,459 ft., P.B. to 3,020 ft. and acidized.

Lawrence County: B. M. Heath 1 Boyd, NW NW NW 24-2n-12w, dry at 2,027 ft., Cypress sand 1,748 ft., Benoist 1,830 ft., Renault 1,891 ft., Ste. Genevieve 1,933 ft., Rosiclare 1,950 ft., McClosky 1,994-2,000 ft. and 2,003-07 ft.

Madison County: H. H. Schwarz 1 Schoeck, SW SE SW 22-3n-6w, dry at 2,393 ft., Trenton lime top at 2,376 ft., cored 2,376-93 ft., small oil and water showing.

Shelby County: Milo Ritchey, SE NE SW 21-10n-5e, dry at 2,066 ft.

Wayne County: Pure 1 G. W. Reed, NE NE NE 18-1s-6e, dry at 3,264 ft., Aux Vases sand at 3,030-38 ft. was shot.

#### Fields

Akin, Franklin County: Seaboard 11 U. S. C. & C. Co., SW SW SW 24-6s-4e, dry at 3,213 ft., Cypress 2,948 ft., Benoist 3,000 ft., upper Renault 3,050 ft., lower Renault 3,100 ft., Aux Vases 3,158 ft., Levias 3,202 ft.

Belle Rive, Jefferson County: Gulf 1 Nathan, C NE NW 27-3s-4e, dry at 3,200 ft., Ste. Genevieve 3,003 ft., Rosiclare 3,061 ft., McClosky 3,184 ft.

Blairsville, Hamilton County: Tide Water 2 Linch, SW SE SW 16-4s-7e, pumped 98 bbl., Aux Vases sand 3,273-89 ft., shot, T.D. 3,294 ft.

Texas 3 R. D. Flanigan, NE SW SW 17-4s-7e, dry at 3,500 ft., Benoist 3,152 ft., upper Renault 3,209 ft., Aux Vases 3,285 ft., Ste. Genevieve 3,299 ft., Fosiclare 3,334 ft., McClosky 3,365-78 ft., 3,436-48 ft., 3,460-63 ft.

Clay City, Wayne County: Pure 2 C. A. Roester, SE SW NW 2-1n-7e, pumped 69 bbl., pay at 2,948-61 ft., shot, T.D. 2,962 ft.

Pure 6 Hosselton-A, SE NW SE 21-2n-8e, pumped 30 bbl., Cypress sand 2,622-28 ft., shot, T.D. 3,100 ft.

Gulf 4 Keck, NE SW NE 26-4n-7e, pumped 25 bbl. oil, 8 bbl. water, Tar Springs sand 2,332-38 ft., T.D.

Friendsville, Wabash County: John Wrather 1 Mundy, NW NE NE 34-1n-13w, pumped 178 bbl., Levias lime 2,621-25 ft., acidized, T.D. 2,632 ft.

Iola, Clay County: Joe Dunbar 1 Huber, SE NE NW 17-5n-5e, dry at 2,515 ft., Aux Vases sand at 2,375-2,400 ft.

New Harmony, White County: Sun 3 A. Atterbury, NE SW SW 30-4s-14w, dry at 2,418 ft., Palestine 2,113 ft., Menard 2,202 ft., lower Menard 2,276 ft., Vienna 2,337 ft., Tar Springs 2,342-2,403 ft.

North Mount Erie, Wayne County: Pure 1 Carter Consolidated, W½ SW NE 26-1n-8e, pumped 51 bbl. oil, 19 bbl. water, McClosky 3,107-11 ft., T.D. 3,122 ft.

North Noble, Richland County: Pure 1 I. Schwartz, NE NW SW 25-4n-9e, pumped 14 bbl., Cypress sand 2,560-76 ft., T.D.

Phillipstown, White County: Jarvis Bros. & Marcell, 10 H. J. Gainer, SW NE NW 31-4s-11e, dry at 1,478 ft., Pennsylvania 1,462-70 ft.

Salem, Marion County: Big Chief 2 Farthing, NW SE NW 15-1n-2e, pumped 63 bbl., Rosiclare pay 2,105-15 ft., shot, T.D. 2,118 ft.

South Grayville, White County: S. C. Yingling 2 Easterwood, C S½ SW NE 20-3s-14w, pumped 92 bbl., Cypress sand 2,808-24 ft., shot, T.D. 2,830 ft.

Stokes, White County: Pure-Carter 1 Gowdy consolidated, SE NE SE 7-6s-9e, pumped 157 bbl., Levias lime 3,033-37 ft., acidized, T.D. 3,045 ft.

## NORTH LOUISIANA

### Thirty-seventh Oil Well Extends the Midway Field

SHREVEPORT, La.—The thirty-seventh producer for the Midway field of Lafayette County, Arkansas, extended the field ¼ mile on the northwest side. It is Barnsdall Oil Co. 1 Darnell, NW NE 9-15s-24w. The well flowed into the pits at the rate of 68 bbl. an hour from Smackover lime at 6,466-82 ft.

**Miller County.**—The Carter Oil Co. had a new well to the north of the Fouke pool, extending that area. The 1-A Strochacker, SE SW SW 31-16s-26w, made 160 bbl. in 24 hours, cutting only 4 per cent water, at a total depth of 3,725 ft.

**Columbia County.**—Prospects of a new Smackover lime pool were reported to be good at the Tide Water Associated Oil Co. 1 Young, 18-18s-19w, about 2 miles west of production in the Atlanta field. Porosity and a show of oil were found in the lime at 8,300 ft. but tests have not been made.

#### NORTH LOUISIANA COMPLETION

West Carroll Parish: Continental Oil Co. 3 Bruce Lumber Co., NE NE NE 2-20n-9e, dry, T.D. 2,698 ft.

## MISSISSIPPI

JACKSON, Miss.—Humble Oil & Refining Co. is building derrick for a wildcat test, 1 J. A. Hurst, in 33-5n-8w, Greene County. The California Co. was running 10-in. casing in 1 Natural Gasoline Co. of Louisiana, Inc., 52-7n-1w, Adams County. Total depth was 1,784 ft. in shale. Pure Oil Co. 1 J. M. McDowell, 1-6n-4w, Adams County, was still shut down on account of high water in the Mississippi River. Gulf Refining Co. 1 Sarah B. Cupit et al, 30-8n-4e, set 8-in. casing at 1,608 ft. and was drilling plug. Gulf was coring at 1,527 ft. at its 1 E. H. Bradshaw, 20-3n-17w, Marion County. That company was recementing 10-in. casing at 4,963 ft. at 1 Aden Davis, 2-9n-9w, Wayne County.

#### MISSISSIPPI COMPLETIONS

Jackson County: Humble 1-B L. N. Dantzler Lumber Co., 20-5s-8w, junked and abandoned, T.D. 11,378 ft. (Lost joint drill stem and 3 drill collars in hole.)

Madison County: Carter Oil Co. 1 Copiah School Land, SE SE SE 16-11n-5e, dry, T.D. 10,502 ft.

Pickens-Vaughn, Madison County: Carter Oil Co. 1 J. Whitworth, SE SW 3-11n-3e, 325 bbl., Wilburn 4,804-22 ft., T.D.

Phillips Pet. 5 Whitworth, NE SE 4-11n-3e, 360 bbl., Wilburn 4,806-14 ft., T.D. 4,910 ft.

## CANADIAN FIELDS

# Oil Found in Lower Devonian at Ram River

CHATHAM, Ont. — In the Ram River-Clearwater area, in the northern foothills about 75 miles west of Red Deer, Ram River Oils 2, LSD 8, 1-37-11w5, finished at 4,340 ft., is flowing by heads, with considerable gas pressure which at times throws the oil over the crown block. Production, coming from a 75-ft. zone in the lower Devonian, is a 40.1-gravity greenish crude, apparently of paraffin base, and the accompanying gas at times burns with a 60-ft. flare. The well is being acidized and will be given an exhaustive production test. From early indications it looks like a fair commercial producer, and possibly the beginning of an important new field. A second test is being located at a point where the producing horizon is expected to be shallower.

**Blood Reserve.**—On the Blood Indian Reserve in southern Alberta, Imperial-Blood Reserve 1, LSD 10, 31-5-23w4, has been abandoned at 6,322 ft. The test got the Madison limestone at 6,267½ ft. but oil shows in the top of the lime failed to develop commercial production.

**TURNER VALLEY COMPLETIONS**

North Turner Valley: Home Oil 14, LSD 16, 33-20-3w5, T.D. 8,332 ft., Madison limestone 7,695 ft., acid. 9,000 gal. to secure initial production of 1,948 bbl. daily of 40.5-gravity crude with 1,938,000 cu. ft. of gas.

West Central section: Lion-Sunray 2, LSD 1, 13-19-3w5, T.D. 8,325 ft., Madison 7,860 ft., acid. 6,000 gal. and produced 597 bbl. daily of 41.6-gravity crude, with 530,000 cu. ft. of gas.

**Del Bonita.**—On the Del Bonita structure in southern Alberta, Pacific Oil & Refinery 1 has spudded, and is drilling below 509 ft. after setting surface casing. Production is expected in the Madison limestone around 5,100 ft. The company has bought the Huff refinery at Lethbridge and is expanding it to 1,200 bbl. daily capacity, and it is planning to secure crude from its own wells to be drilled on the Del Bonita and Twin River structures, believed to be a continuation of the Montana Cut Bank field.

**Brazeau.**—On the Brazeau structure in the northern foothills, Imperial Oil, holding a reservation of 30,000 acres, has located Imperial-Nordegg 1 in 13-40-16w5. Test is expected to spud late this month. A test drilled by Home Oil on Chungo Creek in the same general area faulted back to the Blairmore formation at 8,728 ft. before reaching the Madison, but encountered good shows of oil and gas in the upper horizons. The structure has long been regarded as an important potential oil area, but owing to its remoteness little active development has been undertaken.

**Foremost.**—In the Foremost area of southern Alberta, McColl-Frontenac Oil Co. is carrying on extensive surveys on a large area held under permit. G. D. Wright of Calgary is in charge at this point, while the Gerald M. Young Exploration Co. is test-drilling under the supervision of John E. Futral of Houston, Tex.

**British Columbia.**—Hon. John Hart, premier of British Columbia, has returned to Victoria from Ottawa where he conferred with the Dominion Government regarding the prospective development of a potential oil area in the Peace River block, in the northern part of the province. A deep test previously drilled by the provincial government at Commotion Creek was abandoned at about 6,000 ft. without securing production, but the drilling information secured, together with geological surveys, confirmed the existence of a promising oil structure in the Lone Mountain area southeast of Commotion Creek. The British Columbia government reserves the provincial lands with their oil structures in the northern part of the province and offered them to the Dominion Government for development, free from all taxes and royalties, for the duration of the war as a measure of war assistance. The Dominion Government refused to undertake development, but made a proposal on behalf of the oil companies which was, however, unsatisfactory to the province. Regulations for the development of the area have been drawn up, but the companies have not decided to proceed under the regulations, and as a result the oil reserve may shortly be thrown open to general development.

**Saskatchewan.**—The most extensive drilling campaign in the history of Saskatchewan is predicted for the coming summer, with a total of between 30 and 50 wells expected. The greatest activity is in the Kamsack shallow gas field, where Oil Ventures 1, 2 and 3, LSD 10, 23-29-32w1, and Oil Ventures 4, LSD 2, 27-29-32w1, have all been carried to the shallow gas horizon, between 170 and 235 ft. All were fair gassers. Oil Ventures 5 and 6 are drilling.

# Opposition to Kilgore Bills Increasing

*(Continued from Page 45)*

world, that the United States list of patent disclosures is greater than that of all the rest of the world combined, that this country has the largest list of first-class technical and scientific schools on earth, that in no country or group of countries has development, invention and industrial utilization of research even approached that of this country, the envy of all those nations now trying to tear down this civilization.

**Purpose of Bill Disclosed**

That the purpose of the bills is to build an organization to control, without hindrance from any power, all American enterprise based on any scientific or technical grounds is brought out many times in text of the bills. "The purpose of this act . . . . are: (1) to appraise the current use of scientific and technical knowledge, facilities and personnel . . . . in the national interest **in periods of peace and war**" [Sec. 1 (1)], "to aid, encourage and protect the research and enterprise of inventors, scientists . . . . and to make their resultant discoveries and data more readily available, and without discrimination, to all sections of industry, agriculture and the public . . . . to aid the war effort . . . . and to promote full employment and higher standards of living after the war." [Sec. 1 (6).] "To provide . . . . financial and other assistance to solution of the technical and scientific problems of industry, agriculture and of any agency or establishment or individual inventor" [Sec. 1 (9)]. These provisions and their intent and purport are obvious and need no further explanation.

Regimentation of personnel is similarly absolute. "Scientific and technical personnel" is defined [Sec. 2 (b)] as "all persons excepting physicians and dentists . . . who have had not less than an aggregate of 6 months' training **or employment** in any scientific or technical vocation." The janitor of a chemical laboratory becomes a scientist by imperial ukase of the administrator of this office. The office may similarly foster cooperation with foreign countries, an activity for which one of our largest oil companies has been pilloried and branded as traitors for doing, in the field of synthetic rubber; "to exchange scientific and technical personnel and information with such countries;" [Sec. 4 (g), in part]. By such powers American scientists and technologists may be sent by the administrator to work for and with other nationals with or without the consent of those technologists and scientists. Analogous actions have

been taken by Germany with conquered peoples.

The office may acquire patents, property, etc., under conditions determined by the administrator, who may also dispose of these or any other properties for such compensations as he himself may decide; payments shall be made to the office [Sec. 4 (k)]. This provision for obtaining control of patents is at amazing variance with the attitude of the father of these bills, and of the Department of Justice, as expressed by Thurman Arnold, formerly trust-busting assistant attorney general, now judge of the U. S. Court of Appeals. Judge Arnold, in a hearing before Senator Kilgore's subcommittee on Scientific and Technical Mobilization of the Committee on Military Affairs on March 30, 1943, urged an amendment to S. 702 which would permit the Government to develop methods and processes competing with private industry's methods, and stated that if the Government would develop such methods **and protect its licensees**, "you will keep that Masonite monopoly from dominating this new technique," referring to a patent case which he prosecuted while in the attorney general's office. (Hearing before this subcommittee, Part 1, p. 23.) Judge Arnold further complicated and confused the situation and entangled himself by discussing the German situation where, in one sentence, he states (after it was pointed out that cartels against which he spoke throughout the hearing were employed frequently in Germany "in lieu of diplomacy"): "That is the essence of fascism—a complete partnership between government and monopolies. But the point is that they subsidized research and that is what made them (Germany) strong." Failure to conduct enough research, he continues, is what handicapped the democracies. From this confused illogic it seems that Judge Arnold approves of "partnership between government and monopolies" provided the results are "what made them strong." He then continues with a plea for an organization for scientific and technical development which will compete against private enterprise and research to supply American industry with processes and also protect the users of these processes against infringement suits by private industry! (Hearing record, Part 1, p. 24.)

In this same vein, then, the bill, S. 702, continues by granting the power to finance by any of several means mentioned any function of the office, to acquire contracts, leases or other instruments and "to acquire, improve and alter real and personal property, and **to enter into any other transaction necessary or appropriate for the performance of its (the office's) duties or powers**"! Thus, the powers of this office and therefore of its administrator are made all-inclusive; responsible to no man or group in the legislative or judicial branches of the Government—only to the president.

### Salient Points

Without commenting extensively on each item included in the bills, many others may be pointed out, the effects of which are easily understood:

1. In seizing or taking over for the Government any patent or process or other instrument, "The administrator, subject to review by the president, shall make all determinations in the first instance respecting fair value of such facility and right," with apparently no appeal from such determination. Such requisition shall not extend to any patent, but only to right of license "or any other right respecting user." With the right to license and use without danger of reprisal by the owner, no one could ask for more, since actual ownership of the patent means nothing to the owner without right of protection, redress and control.

2. Applications for priority ratings, allocations, for critical material, etc., for use in scientific development can be made only through this office, under regulations prescribed by the administrator.

3. Rules and regulations to carry out the provisions of Section 7, "Production of the Public Interest in Discoveries and Developments Financed by the United States" shall be laid down by the administrator which "shall thereupon have the force and effect of law." This is a provision for the same effect as that of the directives, etc., issued in recent years which have the effect of law, making the president the law-making as well as law-enforcing power of the Government.

4. The administrator may organize a corporation or corporations to carry out his duties and powers; the office may loan money to and own the stock of such corporations on such terms as the administrator may decide.

These instances of the purpose, function and intention of the bill, and those of its companion bill, S. 607, "To establish an Office of War Mobilization," etc., (presumably unrelated to the recently established Office of War Mobilization under James F. Byrnes) illustrate perfectly the purpose for which they are designed and the part they are to play in the complete regimentation of American science, technology and the personnel engaged and trained in both. Both bills show clearly the direction and nature of the thinking of the most extreme left wing in American sociological politics which obviously intends to direct the most highly technical endeavors by presidential appointees under rules laid down by themselves without responsibility to the Congress or the judiciary. Such trends eliminate from active governing bodies the law-making branch so far as science, technology and industry are concerned. Dismissal of the Diet, the Parliament or the Reichstag has always been the first signal and announcement of absolute dictatorship.

## Ten Arkansas Plants Increase Gas Throughput

EL DORADO, Ark.—An increase of 5,929,000 cu. ft. in the daily gas throughput of 10 natural-gasoline plants in southern Arkansas was reported this week in a summary of April operations by the state Oil and Gas Commission. The plants processed 91,255,000 cu. ft. of gas daily compared to 85,325,000 cu. ft averaged daily during March.

Manufacture of liquid products at the 10 gasoline plants averaged daily 2,057 bbl. of gasoline, 409 bbl. of butane and 40 bbl. of condensate.

Production of natural gas from the 21 gas fields of North Central Arkansas was 13,619,000 cu. ft. daily for the month of April compared to 19,371,000 cu. ft. in March, a decrease of 5,752,000 cu. ft.

## OPA Contends War Taxes Not Operating Cost

CLEVELAND, Ohio. — The East Ohio Gas Co. is presenting its final arguments to overrule the Cleveland 55-cent gas rate ordinance this week before the Ohio Public Utility Commission.

Wartime conditions affecting utility valuations and operating costs were interjected by counsel for the Office of Price Administration who will elaborate on a contention introduced by the city that increased war taxes should not be considered as an operating cost to be passed on to the consumers in fixing the gas rate.

## Wooden Barge Contract Canceled, Steel Specified

PITTSBURGH, Pa.—Contracts were awarded here last week by the U. S. Army district engineers for 168 all-steel welded oil barges shortly after commitments for 195 wooden barges were canceled.

Construction of 305 other wooden barges, 100 tugs and 21 towboats will continue as planned. The wooden barges canceled would have had a carrying capacity of 1,170,000 bbl., while the capacity of the substituted steel vessels will be 1,600,000 bbl. Barges are to be used to supplement transportation facilities between Texas and the eastern district, via the inland waterways.

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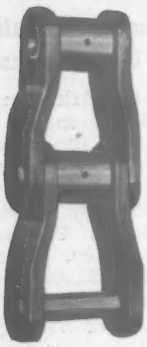

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# Among the Drilling Contractors

**Jack W. Frazier,** Houston, Tex., last week spudded 1 Burney estate, a wildcat which he will drill for Ranger & Frazier in the Katy area of Fort Bend County, Texas. Projected depth is 7,500 ft. The Cox & Hamon 1 W. C. Tyrrell, which the contractor completed in Chambers County, 5 miles northwest of Stowell, was dry at 8,705 ft.

**Arrow Drilling Co.,** Tulsa, has received contract for a new 5,500-ft. wildcat test in Dawson County, Texas, to be drilled for Darby Petroleum Co. on the Annie A. Harris property, Labor 16, League 268, Moore County School Land, 12 miles southwest of Lamesa.

**J. F. West,** Stamford, Tex., has started work on contract to drill Harry Hines 1 Swenson, a 2,000-ft. Swastika test on the A. J. Swenson ranch, 10 miles northwest of Albany and 3 miles northeast of Leuders, Shackelford County, Texas.

**Allied Well Service, Inc.,** Houston, Tex., has received the contract for a workover of Three Bee Investment Corp. 2 Schroeder, in the Dickinson field, Galveston County, Texas.

**Baldridge & King,** McAllen, Tex., are rigging up for a wildcat test which they will drill for their own account in Procion 80 Survey of Starr County, Texas. It is 1 Laredo National Bank. These contractors recently completed 1 Francisco Rodriguez, a dry hole, in Starr County.

**Charles Kendall,** Mount Pleasant, Mich., contractor, will drill Earl G. Hartman 1 Lynch et al, NE NE NW 25-1s-16w, Van Buren County, Michigan.

**Dixie Drilling Co.,** Houston, Tex., will drill a wildcat, 1 Calvert & Todd, for Union Oil Co. of California, in 16-17s-17e, Terrebonne Parish, Louisiana. It is at 10,100 ft. on 12 Sunset, for Texas Co. in St. Charles Parish. Dixie recently completed three wells for Texas, 10 Sunset, in St. Charles Parish, and Unit L and Unit N in the Erath field, Vermilion Parish.

**Union Drilling Co.,** Mount Pleasant, Mich., is the contractor for W. H. Colvin, Jr., 1 Voss et al, SW NW NE 16-1s-7e, Washtenaw County, Michigan.

**C. I. Drilling Corp.,** Houston, Tex., has contracted to drill Schlicher-Thomas Co. 1 Johnson unit, in the Pine Prairie field of Evangeline Parish, Louisiana, for Gulf Refining Co.

**J. A. Gray,** Houston, Tex., has the contract for drilling 1 Tuttle, a wildcat, 12 miles west of Refugio, in Refugio County, Texas, for Pure Oil Co. Projected depth is 6,500 ft. Gray has just finished for his own account the 1 W. W. McCrory, in the West Mauritz field, Jackson County, a 204-bbl. producer, at 5,700 ft.

**Lon H. Cron,** Houston, Tex., will drill two wells for Continental Oil Co. One is the 1 Myrtle Weeks, 2 miles west of the West Ganado field, in Jackson County, Texas. The other is the 19-B Clara Driscoll, in U. Lott Survey 484, Driscoll field, Duval County. Cron recently finished 17-B Clara Driscoll in the same area for Continental.

**Mel Richards,** Big Spring, Tex., has moved new spudder to location for Ben Dansby, Jr., 1 Chester Jones, Section 33, Block 26, H.&T.C. Ry. Survey, Michell County, Texas, 4 miles southeast of the new Vincent area discovery, producing from around 4,100 ft. The well was dry at 3,205 ft., having been drilled to that depth by J. C. Maxwell, Forth Worth operator.

**Homrich & Kendall,** Mount Pleasant, Mich., have contract for John M. Benson 1 Ben Seel, NE NE NW 24, 4s-17w, Berrien County, Michigan, wildcat operation.

**J. C. Arthurs, Inc.,** Mount Pleasant, Mich., has contracted to drill Freeman Oil Co. A-1 State-Aetna, C S½ NE NW, 26-22n-6w, Missaukee County, Michigan.

**Ashby Drilling Co.,** Mount Pleasant, Mich., has contract for Taggart Brothers Co. G-2 Olsen, E½ SW SE, 16-14n-11w, Newaygo County, Michigan.

**Leonard Drilling Co.,** Mount Pleasant, Mich., will drill Mogul Oil Co. 1

George Alderman, NW SE SE 19-22n-4w, Roscommon County, Michigan.

**B. M. McGraw,** Carmi, Ill., contractor, has completed Edward J. Kubat 1 Johnson, 19-4s-11e, White County, Ill., at 3,120 ft.

**Glenn H. McCarthy, Inc.,** Houston, Tex., has the contract to drill a wildcat test for Texas Co. It is the 1 J. E. Broussard et al, in the T.&N.O. Survey, Jefferson County, Texas, 7 miles southeast of Nome. McCarthy is drilling a wildcat for his own account 4 miles southwest of Viterbo, Jefferson County. It is 1 Hebert Trust.


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**Warren & Bradshaw Drilling Co.** have the contract to drill Bell Oil & Gas Co. 2 Byrum, in the Pampa district of Texas. Bell has just completed its first well on a new tract of land obtained on a farmout from Dyck Oil Co. The discovery well is located in W½ SE Section 188, Block 3, I.&G.N. R.R. Survey, Gray and Carson counties, Texas. The well was drilled to the dolomite formation at a depth of 3,296 ft.

**Batson Drilling Co.** was the contractor on Mudge Oil Co. 1 Tanner, in NE NE SE 6-6s-2e, Love County, Oklahoma, near the town of Overbrook, which has indications of being a pool opener. Drilled to 4,510 ft., the hole was plugged back and pipe set at 3,262 ft. Casing was perforated with 116 shots and 3,160 to 3,202 ft. and after cleaning out part way down the well made several heads of oil and mud into pits.

**Olson Drilling Co.,** of Tulsa, and Midland, Tex., is contractor on Shell Oil Co., Inc., 3 Sealy-Smith Foundation, in the Monahans pool of northeastern Ward County, Texas, which was drilling at 6,895 ft. in lime.

**Rowan Drilling Co.,** Fort Worth, Tex., is drilling a wildcat for its own account 5 miles north of the Wasson pool in Yoakum County, Texas, NE NW Section 571, Block D, J. H. Gibson Survey, to go to 5,500 ft.

**Gordon Oil Co.,** rotary contractor, is drilling the first new operation for Isabella County, Michigan, for Leonard, Rawmor & Bartlett, a wildcat on the 1 Latham, 25-16n-6w. Well was drilling at 1,200 ft. **Leonard Drilling Co.** will complete the test to the Dundee with cable tools.

**Parker Drilling Co.** was the contractor on Gulf Oil Corp. 1 Hopkins, C NW SE 8-9n-20w, southwest of Port in Washita County, Oklahoma, which had a show of oil on a drill-stem test. Drilled to 5,554 ft., the drill-stem test was made with packer set at 5,508 ft. The wildcat showed some gas and when the tester was being pulled sprayed some oil.

## Rumors of District 2 and 3 Changes Lack Confirmation

WASHINGTON, D. C.—The Petroleum Administration for War this week declined to confirm or deny rumors that personnel changes are under consideration for the District 2 and District 3 offices. One unconfirmed report was that Wirt Franklin, director in charge of District 2, Chicago, and D. E. Buchanan, occupying a similar position in District 3, Houston, Tex., would be transferred to Washington.


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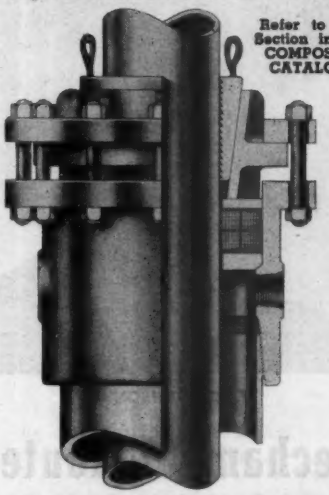

Refer to our Section in the COMPOSITE CATALOG.

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# PERSONALS

*W. C. JOHNSON*

## Mechanical Route Opens Gateway to Superintendency

W. C. JOHNSON, superintendent of operations in the southern district, a newly created assignment in the Standard Oil Co. of California organization, traveled the mechanical route in rising to his present important post.

He was first employed by Standard Oil Co. of California June 28, 1916, as a machinist in the Midway district of Kern County, near Taft, Calif. He continued in that capacity until March 1923, when he was made boiler inspector and continued in this type of work until July 1, 1932, when he was appointed maintenance foreman of the northern district with headquarters at Kettleman Hills where Standard, at that time, was engaged in an extensive development program.

On January 1, 1939, Mr. Johnson was made maintenance superintendent of the northern district and his headquarters were moved from Kettleman Hills to Taft. Two and a half years ago he was transferred to the home office at San Francisco and promoted to the position of manager of the maintenance organization and cost-control division of the producing department, a post he held until his recent promotion as superintendent of operations in the southern district. He will maintain offices at the company's southern division headquarters in Los Angeles.

**Bryan Payne,** president, and **Buck Morris,** vice president, East Texas Salt Water Disposal Co., will speak before the Petroleum Engineers' Club, University of Oklahoma, June 19 at a conference on the general topic of salt-water disposal. The conference opens at 9 a.m.

**Dr. F. H. Dotterweich,** professor of natural-gas engineering at Texas A. & I. College, Kingsville, has returned to that institution from Washington, D. C., to conduct a course in "war products from natural gas." The course, one of the engineer, science and management war-training projects, is offered free to men employed in the oil and gas industry. Dr. Dotterweich is serving as a consultant in the Natural Gas and Natural Gasoline Division of PAW.

**W. V. Vietti,** chief petroleum engineer in the producing department of the Texas Co., Houston, Tex., was the speaker at last week's meeting of the Gulf Coast section of the A.I.M.E., held at the Houston Club. Mr. Vietti spent 5 years in Colombia, where he was vice president and manager of Colombia Petroleum Co. and South American Gulf Oil Co. affiliates of Texas Co., and Socony-Vacuum Oil Co., Inc. His address, illustrated with colored slides, dealt with phases of life in that country.

**Walter H. Kiley,** general superintendent of export and coastwise terminals for Warren Petroleum Corp., has been transferred from the Norsworthy terminal, on the Houston, Tex., ship channel, to a new office opened in Houston. **Kenneth T. White,** who formerly represented Warren in Salem, Ill., has been assigned to the new Houston office as special representative to handle liquefied-petroleum-gas products and natural gasoline.

**George Watt** of Calgary, Alta., for several years in charge of the drilling, production and exploration activities of the British-American Oil Co. in western Canada, has been appointed manager of the company's newly created western crude-oil supply department, and will assume his new duties on his return from a tour of inspection of the United States Mid-Continent fields where he is visiting the properties and offices of the Toronto Pipe Line Co. and the British-American Oil Co. Under the company's new program, **J. A. McCutchin** will be manager of the production department, handling all matters pertaining to drilling and production as well as the company's Turner Valley gasoline absorption plant. **H. A. Taylor,** formerly petroleum engineer in the production department, has become superintendent of the Turner Valley absorption plant, with headquarters in Turner Valley. **Henry Carter Rea,** who came to Calgary last fall as geological observer, will be manager of the exploration department, in charge of exploration and geology. **Charles Day, Jr.,** will have charge of land and leasing.

**J. A. Warren,** of Denver, Colo., president of the Kinney-Coastal Oil Co., has added a new word to the lexicon of radio programs. He refers to the interruptions for a 60-second message from the Government as "Propagandoodle."

**Dan Heninger,** Ohio Oil Co., is the new president of the North Texas Geological Society, Wichita Falls, Tex. **Dolphe E. Simic,** Cities Service Oil Co., is vice president and **Carlos M. Ferguson,** Magnolia Petroleum Co., secretary and treasurer.

**Frith Owen,** consulting geologist, was elected president of the Corpus Christi (Tex.) Geological Society at the annual meeting last week in the Plaza Hotel. **E. D. Pressler,** Humble Oil & Refining Co., was chosen vice president; **Bruce Scrafford,** independent geologist associated with La Gloria Corp., secretary-treasurer; **Henry. D. McCallum,** Humble, member of the executive committee; **G. B. Gierhart,** Humble, representative to the American Association of Petroleum Geologists. Mr. Owen succeeds **Dr. W. Armstrong Price,** consulting geologist.

**Warner Clark,** general manager of conservation in Standard Oil Co. of California's producing department, has been elected chairman of the Conservation Committee of California Oil Producers. The committee, which is composed of representatives of California oil oper-

ators, acts as an advisory group to the operators on conservation matters.

**Dr. C. C. Sun,** senior geologist of the China Geological Survey, was guided last week on an inspection trip through the Mid-Continent fields by **W. D. McBee** and **Don Hyatt,** Carter Oil Co., geologists.

*R. B. SAXE*

**R. B. Saxe,** Pampa, Tex., field foreman of the Pampa district for Gulf Oil Corp., has been promoted to district superintendent and assigned to the company's Panhandle headquarters at Amarillo. Mr. Saxe has been employed by Gulf for 22 years, 15 of which have been spent in the production division. **T. A. Watkins,** previously assigned to the Borger-Dial district, has been transferred to Pampa where he assumes duties of field foreman, succeeding Mr. Saxe.

**E. O. Bennett,** chief petroleum engineer for Continental Oil Co., Ponca City, Okla., resigned June 15 and will immediately open a consulting office at Houston, Tex. He had been employed by Continental since 1926, having served as chief engineer, assistant manager of drilling and production. Mr. Bennett's picture and a biographical sketch appeared on page 33 of the May 27 Journal in connection with an award of the honorary degree of doctor of engineering by the Agricultural & Mechanical College of Texas.

**Herbert H. Ross,** vice president and director of the National Gas & Electric Co., and president and general manager of Industrial Gas Corp., a subsidiary of Newark, Ohio, has resigned to accept a position with Oklahoma Natural Gas Co.

**Edmund du Pont,** son of the late Francis I. du Pont, has been appointed vice president of the Wilmington Chemical Corp., in charge of plant operations. He will headquarter in Wilmington, Del. Manufacturing activities recently have been expanded to provide for increased production of a chemical used in the production of synthetic-rubber goods.

**J. Neil Taylor,** employed in the purchasing department of Humble Oil & Refining Co., Houston, Tex., until entering military service, has been promoted to the rank of first lieutenant and assigned to the Fort Worth Quartermaster Depot as public relations officer.

**Franklyn Waltman,** representative at Washington, D. C., since July 1942 for Houdry Process Corp. and Sun Oil Co., has been appointed director of public relations for the latter company, succeeding Judson C. Welliver, who died recently. **Edwin W. Gableman,** formerly correspondent for the Cincinnati Enquirer, has succeeded Mr. Waltman at Washington. Mr. Waltman is a veteran newspaper man, having started his career in 1922 with the Baltimore Sun. He joined the Washington Post in 1933. He served as director of publicity of the Republican National Committee from April 1938 until December 1941.

**T. E. Keefer** has been appointed field superintendent and **G. A. Schell, Jr.,** was made assistant superintendent in the Texas Panhandle area by Stanolind Oil & Gas Co.

**Lt. Col. Guy I. Warren,** independent oil operator of Corpus Christi, Tex., was honor guest at a coffee given last week by the directors of the Chamber of Commerce in that city at the Robert Driscoll Hotel. Colonel Warren left later in the day for Charlottesville, Va., to attend the School of Military Government before being assigned to a post in the Army. He served as chairman of the oil and gas committee of the Chamber of Commerce.

**R. E. Spratt,** district engineer of the oil and gas leasing division of the U. S. Geological Survey, with headquarters in Denver, Colo., has been transferred to the offices in Washington. He is succeeded by **G. G. Frazier,** Casper, Wyo., who will be engineer for the Denver district.

**Maj. R. C. Barthold,** 35, Army Air Forces, formerly secretary-treasurer of the Iron Mountain Oil Co., Fort Worth, Tex., was reported missing in action in the European theater of war. Major Barthold entered the services as captain in February 1942, and was assigned to the General Staff in Washington. He came to Fort Worth from Lima, Ohio, where he was in the banking business.

**C. C. Harbour** has become field superintendent in the Nocona (Texas) area for Stanolind Oil & Gas Co.

**Murray L. Neumann,** Carter Oil Co., geologist and president of the Tulsa Geological Study Group, announced last week that the organization has granted a scholarship to **Nathan Altschuler,** a graduate of Tulsa Central High School, to spend the summer at the Princeton University geological field camp in Wyoming, directed by **Prof. W. T. Thom, Jr.**

**Willard F. Jones,** general manager, marine department, Gulf Oil Corp., has been elected president at the biennial meeting of the American committee of Lloyds Register of Shipping.

*G. H. FANCHER*

**Dr. George H. Fancher,** professor of petroleum engineering at the University of Texas, Austin, has been retained by the Arkansas Oil and Gas Commission to supervise work on the problem of reinjecting salt water back to the horizon from which it was produced in the newer fields of that state and to make a study of the secondary-recovery possibilities in the older fields. **Steve DeBoard, Jr.,** a petroleum engineer from the University of Texas, and **C. V. Lisman, Jr.,** a geologist from the University of Arkansas, have been appointed assistants to Dr. Fancher.

**Lt. Wade H. Smith, Jr.,** former acting chief scout for the Magnolia Petroleum Co., Dallas, Tex., has reported for Army duty in New Orleans, La. Lieutenant Wade's home is in Corsicana. He was recently commissioned upon his graduation from Officer Candidate School, State College, Miss.

**L. O. Herndon,** field superintendent; **W. L. Austin,** production foreman, and **Wright Bradley,** field engineer, are new appointments of Stanolind Oil & Gas Co., in the Elk Basin area of Wyoming.

**Joseph Jensen,** chief petroleum engineer of Tide Water Associated Oil Co., has been elected chairman of the California Allocation Committee, and **R. P. Huggins,** of Western Gulf Oil Co., has been elected chairman of the Administrative Committee of the Conservation Committee of California Oil Producers.

**William F. Humphrey,** president of Tide Water Associated Oil Co. and general chairman of the petroleum committee for District 5 has announced the appointment of **Charles S. Jones,** president of Richfield Oil Corp. and chairman of the transportation committee for District 5, as vice chairman of the general committee.

**James A. Matthews,** Centralia, Ill., has been reelected president of the Independent Oil Producers Association of Illinois. **John J. Hassler,** Mount Vernon; **J. H. Steinmesch,** Eldorado; **E. J. Koenig,** Centralia, and **Leo V. Horton,** Mount Vernon, are new vice presidents.

**D. J. Polk,** formerly scout for Carter Oil Co., at the Carmi, Ill., office, has been transferred to the geological department as assistant to **Robert M. English. Arch Walker,** formerly of Cleveland, Okla., has been assigned to scouting duties in the Carmi district.

# Market Developments

## East Coast

NEW YORK.—The possibility that the revised ODT list assuring preferential treatment to essential industries in the East Coast shortage area would not be evoked has arisen. Apparently measures already undertaken will restrict nonessential consumers sufficiently so that essential services will not be impaired. Under the plan essential services were ranked in four classes: AA-1, most critical; A-1, very critical; A-2, critical, and A-3, important. The AA-1 rating applied only to war material. Petroleum and refined products were grouped in Class A-1. Reluctance of ODT officials to invoke the list was seen in the fact that, they stated, the 40 per cent mileage reduction ordered for all commercial vehicles would be increased to 50 per cent for nonessential vehicles before priority ratings were applied.

In spite of the evidence that critical transportation and farm gasoline needs were now being met, any improvement so far as the average consumer is concerned is still distant. The A.P.I. index of available supplies dropped to 25.6, only 0.1 point above the all-time low of a month ago. The big-inch break has cost the East Coast an estimated 1,720,000 bbl. of oil.

Domestic fuel-oil consumers have been urged to fill their tanks during July as soon as renewal forms are received. This step was taken to ease the distribution problem as much as possible before the next consuming season.

## Mid-Continent

SCARCITY of practically all petroleum products this week continued as the dominant factor in Mid-Continent refinery markets. Calls continued especially brisk from agricultural centers where activity has been redoubled since recession of flood waters.

Competitive grade gasoline is in particularly acute demand. Much of this motor fuel has been traded this spring and early summer among refiners. The larger plants have done an inordinately large volume of reforming in order to manufacture the quality gasoline now required in larger percentages, compared to regular and third-grade fuel. Inability of rural consumers to satisfy their demands for third-grade gasoline has diverted some of the calls to tractor fuels and kerosene which are exceedingly scarce among Mid-Continent refineries and available only in small quantities.

Some refiners still are short of crude, although upward adjustments made at the start of June provided necessary relief at one or two spots where supplies were most critical. Much of the anxiety over crude supplies, however, is projected over the next 6 to 12 months. Some of the current attempts to solidify positions with respect to crude are based on the generally accepted conclusion that Middle West production will continue downward, and result in an acute shortage within a year.

## Pacific Coast

LOS ANGELES, Calif. — California refiners are preparing to begin making deliveries of charging stock for butadiene units expected to get into operation within the next 45 days. The Southern California Gas Co.'s butadiene unit is nearing completion and the company has been heating parts of the unit for the past 3 weeks. This plant will be the first butadiene unit to get into active operation in California. Refiners who have been committed to making deliveries to Southern California's plant started about 2 months ago building up stocks of tops. These tops will be used and not gasoline as previously reported.

There is a marked shortage of commercial butane in California and it would not be at all surprising if consumers of propane-butane in commercial trucks would be obliged to change over to gasoline.

Until deliveries are made to butadiene units, gasoline prices will probably continue at present levels because by that time some of the motor fuel now entering the commercial field may find its way into synthetic-rubber plants.

Fuel-oil prices are expected to continue at present levels until such time as the Navy requires increased amounts.

A general survey has been undertaken to determine the feasibility of reducing commercial deliveries of fuel oil to consumers in order to conserve this refinery residuum for Army and Navy use.

## A.P.I. REFINERY REPORT

(Figures in thousands of barrels)

Week Ended June 5, 1943

| | Dly. crude runs to stills | Stocks: Gasoline | Stocks: Residual | Stocks: Gas oil |
|---|---|---|---|---|
| Appalachian | 155 | 2,430 | 485 | 873 |
| Ind., Ill., Ky. | 696 | 10,372 | 3,135 | 4,254 |
| Okla., Kan., Mo. | 314 | 6,356 | 1,566 | 1,742 |
| Censored area* | 1,708 | 32,696 | 11,340 | 13,780 |
| Rockies | 83 | 1,872 | 585 | 329 |
| California | 706 | 20,479 | 50,099 | 11,599 |
| Total 6- 5-43 | 3,662 | 82,205 | 67,210 | 32,577 |
| Total 5-29-43 | 3,679 | 83,937 | 67,682 | 32,274 |
| Total 6- 6-42 | 3,462 | 93,192 | 79,806 | 30,604 |

*Reports combined on East Coast, Texas Gulf, Louisiana-Arkansas and Inland Texas at request of PAW.

### CRUDE-OIL STOCKS

(Bureau of Mines Estimates)

| Week ended: | Bbl. of crude* |
|---|---|
| June 5, 1943 | 245,107,000 |
| May 29, 1943 | 245,752,000 |
| June 6, 1942 | 254,816,000 |

*Excludes unrefinable stocks in California.

## Gulf Coast

HOUSTON, Tex. — Attention of refiners centered largely this week on problems growing out of the new PAW directive, which establishes zones in District 3 and fixes rigid rules concerning the distribution of gasoline. Some refiners said changes probably would have to be made here and there to prevent backing up of gasoline stocks in areas where there are large refineries, whose outlets are so contracted by the PAW directive as apparently to make it impossible to move all their output. "It looks to me," said a representative of one major company, "as though some plants simply can't move all their gasoline without violating the zoning regulations."

No mitigation was visible in a gasoline shortage unanimously regarded as serious. If the situation had changed at all it was for the worse. All were hoping that conditions would improve as the new PAW directive, designed to fill local demands from the nearest sources of supply and to effect a more efficient use of transportation facilities, gets into smooth operation.

A few tank cars which in the recent past have been moving refined products to the North and East were reported this week to be carrying crude oil to eastern points. The explanation of this phenomenon seemed to be that stocks of finished products actually had become so low that the cars could not be employed in their former duty.

Although gasoline is usually mentioned first in any discussion of current deficiencies, there is no abatement in the shortage of other products. A more acute scarcity of motor oils was reported this week, and natural gasoline was an object of increasingly active search.

# Refinery Prices

(Prices as of June 15)

**Quotations are f.o.b plant in cars and in cents per gallon except where otherwise noted. They are exclusive of the federal excise taxes of 1.5 cents a gallon on gasoline and 4.5 cents a gallon on lubricating oils, and do not include marine lighterage charges.**

## REFINERY GASOLINE

| Octane (A.S.T.M.): | †80 | 74-76 | 72-74 | 68-70 | 63-66 |
|---|---|---|---|---|---|
| Mid-Continent* | ..... | ..... | 5.875-6.000 | ..... | 5.500-5.625 |
| Pennsylvania | ..... | 6.750-7.000 | ..... | ..... | ..... |
| Gulf Coast‡ | 6.00-6.50 | ..... | §5.750-6.250 | §5.750-6.250 | §5.250-5.750 |
| Northeast Coast | 9.80 | ..... | 9.2 | 9.2 | ..... |
| California | ..... | 6.125-6.500 | 6.000-6.125 | 5.500-6.000 | 5.000-5.250 |

*Basis Group 3. †1939 C.F.R. (research method). ‡Integrated companies restricted to lowest prices. §Unleaded.

## KEROSENE AND NO. 1 FUEL OIL

| Gravity: | 46 | 45 | 42-44 | 41-43 | 38-40 |
|---|---|---|---|---|---|
| Mid-Continent* | ..... | ..... | 4.500 | 4.375 | ..... |
| North Louisiana | ..... | ..... | ..... | 4.500-4.750 | ..... |
| Pennsylvania | 6.250-6.625 | 6.125-6.250 | ..... | ..... | ..... |
| California | ..... | ..... | ..... | 4.500-5.500 | 4.250 |
| Northeast Coast | ..... | ..... | ..... | 6.80 | ..... |
| Gulf Coast | ..... | ..... | ..... | 4.125 | ..... |

*Basis Oklahoma Group 3.

## TRACTOR, DIESEL, AND BUNKER FUEL OIL

| Specifications: | 46-48° G. | 24 D.I. | 48-52 D.I. | 58 & above | Diesel bunkers | Residual Bunker C§ |
|---|---|---|---|---|---|---|
| Mid-Continent* | 4.125 | ..... | ..... | ..... | ..... | $0.80-1.27 |
| California | ..... | 2.750-4.000 | ..... | ..... | ‡1.35-1.45 | 0.85-1.00 |
| Gulf Coast | ..... | ..... | 4.000 | 4.125 | 1.45 | 0.85-1.27 |
| Northeast Coast | ..... | ..... | ..... | 6.800 | 2.780 | 1.65-2.07 |
| North Louisiana | ..... | ..... | ..... | ..... | ..... | 0.80-1.27 |

*Basis Oklahoma Group 3 †10-14° gravity. ‡Pacific Specification 200. §Gravity range.

## FURNACE OIL, GAS OIL, FUEL OIL

| | No. 2 | No. 3 | No. 5 | No. 6 |
|---|---|---|---|---|
| Mid-Continent* | 3.625-3.750 | 3.500-3.625 | $0.85 | $0.80 |
| Pennsylvania (West) | 5.875-6.125 | 5.875-6.000 | †5.250-5.500 | ..... |
| Northeast Coast | 6.7 | 6.7 | 1.95 | 1.65 |
| California | 5.5 | 5.5 | ‡1.10-1.25 | §1.10-1.15 |
| Gulf Coast | 3.875-4.0 | ..... | 1.65 | 0.85 |

*Basis Oklahoma Group 3 †36-40 gravity fuel. ‡Pacific Specification 300. §Pacific Specification 400.

## NATURAL GASOLINE

| Grades: | 26-70 | 18-55 |
|---|---|---|
| Oklahoma (Group 3) | 3.875 | 4.650 |
| North Texas | 3.500 | 4.200 |
| North Louisiana | 3.625 | 4.350 |
| California | 4.875 | 5.500 |

## LUBRICATING OILS

**Bright and Steam Refined**

| | | |
|---|---|---|
| **OKLAHOMA (Group 3)—** | | |
| 200-210 D, 10-25 | | 27.00 |
| 150-160 D, 0-10 | | 23.00 |
| 120-125 D, 0-10 | | 22.00 |
| Steam refined: | | |
| 600 dark green (untreated) | 9.00 | 9.50 |
| **PENNSYLVANIA—** | | |
| Bright Stocks (Pennsylvania Grade No. 8 color, 140-150 at 210, 545-550 flash) | | |
| 10 pour point | | 30.50 |
| 15 pour point | | 29.50 |
| 25 pour point | 25.00 | 28.00 |
| Steam refined: | | |
| 600 | 15.00 | 16.00 |
| 650 | 15.50 | 16.50 |
| 600 flash | 16.00 | 17.50 |
| 630 flash | 17.00 | 17.50 |

**Neutral Oil**

(Vis. at 100° F. except Pennsylvania and color N.G.A.)

| | |
|---|---|
| **OKLAHOMA (Group 3)—** | |
| 0-10 pour point: | |
| 200-3 | 15.00 |
| 300-3 | 18.00 |
| 500-3 | 19.50 |
| 600-3 | 20.00 |

Note: Viscous neutrals, 10-25 pour, quoted 0.5 cent under 0-10 oils.

**Neutral Oils**

| | | |
|---|---|---|
| **CALIFORNIA—** | | |
| Pale oils: | | |
| 200-2½-3 | 7.00 | 7.75 |
| 400-3-4 | 7.25 | 8.00 |
| 600-3-4 | 8.75 | 11.00 |
| Red oils: | | |
| 200-4-5 | 7.00 | 7.75 |
| 400-5-6 | 9.00 | 11.00 |
| 500-900, 5-6½ | 9.25 | 11.25 |
| **GULF COAST—** | | |
| Pale oils: | | |
| 200-3 | 8.50 | 8.75 |
| 300-3 | 9.00 | 9.25 |
| 500-3½ | 9.75 | 10.00 |
| 750-3½ | 10.00 | 10.25 |
| 2,000-4 | 10.50 | 10.75 |
| 3,000-4 | 12.25 | 12.50 |
| **PENNSYLVANIA—** | | |
| 150 vis. at 70° F., 3 color, 400-405 flash: | | |
| Zero pour point | | 37.50 |
| 10 pour point | | 36.50 |
| 15 pour point | | 35.50 |
| 25 pour point | | 30.00 |
| 200 vis. at 70° F., 3 color: | | |
| Zero pour point | | 39.50 |
| 10 pour point | | 38.50 |
| 15 pour point | | 37.50 |
| 25 pour point | | 32.00 |

## WAX

(Cents per pound)

| | |
|---|---|
| **OKLAHOMA (Group 3)—** | |
| 124-126 (A.m.p.) w.c. scale | 4.250 |
| **PENNSYLVANIA (inland refineries)—** | |
| 122-124 (A.m.p.) w.c. scale | 4.250 |
| 124-126 (A.m.p.) w.c. scale | 4.250 |
| **NEW YORK—** | |
| Wax in bags fully refined: | |
| 130-132 (A.m.p.) wax | 5.850 |
| 133-135 (A.m.p.) wax | 6.150 |
| Crude scale: | |
| 124-126 (A.m.p.) w.s. | 4.250 |
| 124-126 (A.m.p.) y.s. | 4.250 |

## TANK-WAGON PRICES IN 50 CITIES

(Gasoline prices based on regular grades, tax included, undivided dealer)

**ATLANTIC AND NEW ENGLAND**
(Socony-Vacuum Oil Co., Inc., and Atlantic Refining Co.)

| | Dealer tank wagon | Combined tax | Kero. tank wag. |
|---|---|---|---|
| Baltimore, Md. | 15.95 | 5.50 | 10.50 |
| Boston, Mass. | 14.90 | 4.50 | 10.10 |
| Burlington, Vt. | 16.90 | 5.50 | 10.20 |
| Buffalo, N. Y. | 16.20 | 5.50 | 10.90 |
| Dover, Del. | 16.70 | 5.50 | 13.30 |
| Hartford, Conn. | 15.60 | 4.50 | 10.00 |
| Manchester, N. H. | 17.30 | 5.50 | 12.10 |
| Newark, N. J. | 15.20 | 4.50 | 10.00 |
| New York, N. Y. | 16.10 | 5.50 | 10.10 |
| Philadelphia, Pa. | 16.20 | 5.50 | 11.95 |
| Pittsburgh, Pa. | 16.70 | 5.50 | 12.30 |
| Portland, Me. | 16.30 | 5.50 | 10.30 |
| Providence, R. I. | 15.00 | 4.50 | 9.90 |
| Washington, D. C. | 15.20 | 4.50 | 11.30 |
| Average 14 cities | 16.02 | 5.14 | 10.95 |

(All prices undivided dealer basis.)

**CENTRAL**
(Standard Oil Co. of Indiana, Standard Oil Co. of Ohio, Continental Oil Co. and Texas Co.)

| | Dealer tank wagon | Combined tax | Kero. tank wag. |
|---|---|---|---|
| Chicago, Ill. | 13.40 | 4.50 | 10.30 |
| Cleveland, Ohio | 15.00 | 5.50 | *9.00 |
| Dallas, Tex. | 13.00 | 5.50 | 7.00 |
| Des Moines, Iowa | 14.40 | 4.50 | 9.80 |
| Detroit, Mich. | 14.40 | 4.50 | 9.60 |
| Fargo, N. D. | 16.90 | 5.50 | 11.30 |
| Huron, S. D. | 16.30 | 5.50 | 10.70 |
| Indianapolis, Ind. | 15.20 | 5.50 | 9.80 |
| Little Rock, Ark. | 17.50 | 8.00 | 10.00 |
| Milwaukee, Wis. | 16.10 | 5.50 | 10.50 |
| Minneapolis, Minn. | 15.40 | 5.50 | 10.30 |
| Omaha, Neb. | 15.40 | 6.50 | 9.80 |
| Tulsa, Okla. | 16.50 | 7.00 | 8.50 |
| Wichita, Kans. | 12.70 | 4.50 | 8.00 |
| Average 14 cities | 15.15 | 5.57 | 9.61 |

*Includes 1-cent state tax.

**SOUTHEASTERN**
(Standard Oil Companies of New Jersey, Kentucky, and Louisiana)

| | Dealer tank wagon | Combined tax | Kero. tank wag. |
|---|---|---|---|
| Atlanta, Ga. | 16.90 | 7.50 | *11.50 |
| Birmingham, Ala. | 16.50 | 8.50 | 9.00 |
| Charleston, S. C. | 16.95 | 7.50 | ..... |
| Charleston, W. Va. | 19.25 | 6.50 | 13.30 |
| Charlotte, N. C. | 20.10 | 7.50 | 11.30 |
| Jacksonville, Fla. | 16.90 | 8.50 | 9.50 |
| Jackson, Miss. | 17.50 | 7.50 | †9.00 |
| Louisville, Ky. | 16.50 | 6.50 | 8.50 |
| Memphis, Tenn. | 17.90 | 8.50 | 10.50 |
| New Orleans, La. | 17.75 | 8.50 | *10.00 |
| Norfolk, Va. | 17.45 | 6.50 | 12.30 |
| Average 11 cities | 16.34 | 7.50 | 10.49 |

*Includes 1-cent state tax.
†Includes ½-cent state tax.

**MIDWESTERN**
(Continental Oil Co.)

| | Dealer tank wagon | Combined tax | Kero. tank wag. |
|---|---|---|---|
| Albuquerque, N. M. | 17.50 | 7.50 | 10.00 |
| Boise, Idaho | 20.10 | 6.50 | 16.50 |
| Casper, Wyo. | 17.00 | 5.50 | 12.00 |
| Denver, Colo. | 14.50 | 5.50 | 11.00 |
| Helena, Mont. | 17.00 | 6.50 | 13.00 |
| Phoenix, Ariz. | 18.50 | 6.50 | 12.50 |
| Reno, Nev. | 17.50 | 5.50 | 13.50 |
| Salt Lake, Utah | 18.50 | 6.50 | 14.50 |
| Average 8 cities | 17.58 | 6.25 | 12.88 |

**PACIFIC COAST**
(Standard Oil Co. of California)

| | Dealer tank wagon | Combined tax | Kero. tank wag. |
|---|---|---|---|
| Portland, Ore. | 17.00 | 6.50 | 13.80 |
| San Francisco, Calif. | 14.50 | 4.50 | 11.50 |
| Seattle, Wash. | 17.00 | 6.50 | 13.80 |
| Average 3 cities | 16.17 | 5.83 | 13.03 |
| Average 50 cities | 16.55 | 5.96 | 10.87 |

# Preventing trouble beats fishing...

*Information supplied by "Oil and Gas Journal"*

**Probably the best way to handle a fishing job is to avoid the occasion for it. The following precautions are suggested as a means to that end:**

**1. Keep water loss and filter cake of mud at a minimum. Keep mud clean and free from sand.**

**2. Come off bottom slowly in low gear until sure there is no danger of sticking pipe.**

**3. Don't "cut the rope" going in and risk hitting cavings or a ledge.**

**4. Don't pull on the pipe when it has a tendency to drag. Work it gently.**

**5. Avoid circulating with pipe stationary or rotating slowly.**

**6. Be extra cautious when coming out after circulating.**

**7. If pumps are stopped, or drilling is halted, raise pipe as far as possible.**

**8. If mud line loses pressure, come out to find cause.**

**9. When there is any diminuition in return check pump and mud. Either fluid stream is insufficient, or there is loss to formation.**

**10. Investigate any unusual behavior of drill string immediately. Bouncing of the bit may mean either a rough formation or junk in the hole. If trouble is suspected, come out and investigate.**

**CLIMAX FURNISHES AUTHORITATIVE ENGINEERING DATA ON MOLYBDENUM APPLICATIONS.**

ARMY E NAVY

**MOLYBDIC OXIDE, BRIQUETTED OR CANNED • FERROMOLYBDENUM • "CALCIUM MOLYBDATE"**

**Clima[illegible]olybdenum Company**

**500 Fi[illegible]ve[illegible] • New York City**

**MOLY**

# Equipment Progress

## Preload Co. Completes Two Large Jobs

According to an account by Curzon Dobell, general manager of Preload Co. of Canada, Ltd., the company has recently completed two tanks by the patented Preload construction that are outstanding. The one is a group of the largest surface oil tanks ever built on this continent, and the other is the first elevated municipal water tank to be built of concrete in Canada. According to Mr. Curzon, the Preload system is a method of concrete construction whereby the steel reinforcing is preloaded against the concrete with which it is combined in such a way that the live load causes the concrete to give in compression instead of being stressed in tension. In this way all cracking due to loading, shrinkage, or temperature changes is eliminated within the limits of design factors, it is claimed.

The company has offices in Long Island City, N. Y.; Boston, Mass.; Washington, D. C.; Montreal, Que.; Toronto, Ont., and Halifax, N. S.

## Refinery Equipment, Inc., Name for Sonken-Galamba

So that the name of the former Sonken-Galamba Supply Co. might be more easily associated with the industry it serves, W. C. Berry, president of the firm, announces it will hereafter be known as Refinery Equipment, Inc. There will be no change in staff or officers, Mr. Berry said.

This firm, widely known in the oil and refinery industry, buys and sells complete refineries and carries large stocks of reconditioned refinery equipment. Branches of the firm, with headquarters in Tulsa, are maintained at Kansas City, Kans., and Kilgore, Tex.

## Big Four Acquires Brauer Supply Co.

The Big Four Machine & Supply Co. on March 15 purchased all patents and warehouse stock of the Brauer Machine & Supply Co. and will continue manufacturing and distributing this material from the Clay City, Ill., shop.

W. N. (Bill) Stone, for several years with the Brauer Machine & Supply Co. at Oklahoma City, Okla., is now connected with Big Four Machine & Supply Co. in the capacity of field representative and will specialize in the sale of Brauer products which this company recently acquired. John R. Riley continues as president of the company.

## W-K-M Officers Proud Of Minute Man Flag

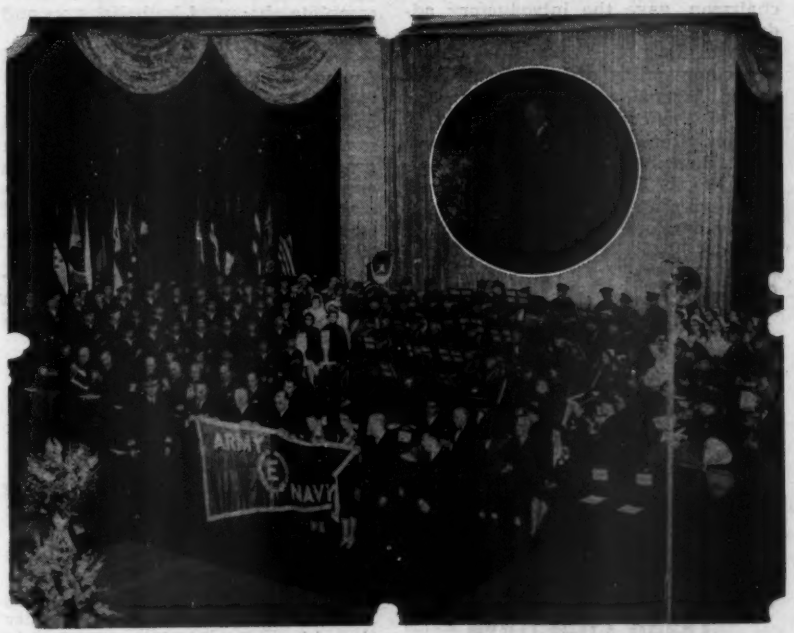
Fred McManis, president, and L. O. Koen, vice president, of W-K-M Co., Inc., Houston, Tex., were holding their chins a little higher this week, following presentation of the Minute Man war bonds flag to their plant. A. C. Johnson, representing the war savings organization of Harris County, made the presentation. Mr. McManis congratulated the workers on 94 per cent participation in bond purchases and 14 per cent of the payroll going into war bonds.

## Bethlehem Supply Opens New Store at Pratt, Kans.

H. A. Wilson, office manager Bethlehem Supply Co., has announced the opening of a new store at 414 South Main Street, Pratt, Kans. (Telephone 40), effective June 15.

**Leeds & Northrup Co., 4901 Stenton Ave., Philadelphia, Pa.**—A souvenir booklet, prepared for the members of its organization, commemorating the celebration attendant to receiving the Army-Navy "E". The booklet, 14 by 11 in. in size, and with 24 pages, is a pictorial treatment of the occasion. Pictures are arranged in chronological order, and their captions constitute, with the book's brief introduction, a running story of the event from the time William L. Batt, guest speaker from WPB, first entered the gate until Admiral Wiley, who presented the pennant, completed his trip through the plant.

## THE WM. POWELL CO. AWARDED ARMY-NAVY "E"




The Wm. Powell Co. of Cincinnati has recently been awarded the Army-Navy Production Award, symbolized by the Army-Navy "E" flag and the lapel pins for every member of both plants of the company.

The photograph above shows the scene on the stage of Cincinnati's largest auditorium, Music Hall, just after the presentation of the flag by Rear Admiral H. B. Taylor, C.E.C., U.S.N., and its acceptance by James Coombe, president, The Wm. Powell Co. Inset shows President Coombe making the acceptance speech. Over two thousand employes and friends of the Powell company attented the impressive ceremonies. Lt. Col. Paul J. Carr, executive officer, Fort Thomas Military Post, represented the Army in presenting the Army-Navy "E" emblems to be worn on the lapel.

The Wm. Powell Co. is one of the oldest valve manufacturers in the

United States and one of the oldest manufacturing concerns in Cincinnati, a city noted for the age of its many diversified industries. Founded in 1846, the company has served the country in four wars, and in the intervening years of peace has made many notable contributions to the industrial progress of America. During its 97 years of operation it has developed a complete line of valves fulfilling every requirement of American industry. These include globe, angle, gate, check, relief, Y, non-return and other types in bronze, iron, steel, pure metals and special alloys to meet every need for dependable flow control equipment.

## Climax Engineering Wins "E" Award

Amid colorful and impressive ceremonies, at the factory site on the Mississippi River, the Army-Navy Production Award was presented to the employes and management of the Climax Engineering Co., Clinton, Iowa. The coveted "E" banner, in recognition of Climax's high achievement in the production of war equipment, was the first such honor to be awarded in Clinton.

G. W. Dulany, Jr., Climax board chairman, gave the introductory address. Presentation of the award was made by Brig. Gen. Norman F. Ramsey, commanding officer of the Rock Island Arsenal, and accepted on behalf of the company by Edward F. Deacon, president of Climax. Comdr. A. F. Duernberger, commanding officer, Naval Training School, Ames, Iowa, presented the token "E" pins to the employes.

## Correction

In the May 6 issue of The Oil and Gas Journal an advertisement of the Florindin Co. was illustrated with a view of a solvent treating plant of the Continental Oil Co., mistakenly labeled as a hydrofluoric-alkylation unit. We and our advertiser are now informed that no such unit is included in the plant represented and the advertisement will not appear again till a correct illustration is substituted.

# Trade Literature

**Ingersoll-Rand Co., 11 Broadway, New York, N. Y.**—A 20-page descriptive booklet, in two colors and with 27 illustrations, on vertical axial and mixed-flow pumps. The units described are designed for pumping large volumes of liquid at comparatively low heads. They are available in a complete range of sizes for capacities of 75,000 g.p.m. and for heads to 100 ft. per stage.

# Among Equipment Men

## Vapor Recovery Systems Assigns New Engineers

The Vapor Recovery Systems Co. of Compton, Calif., announces the following appointments as sales engineers:

Clifford T. Stanhope is in charge of the "VAREC" eastern office and warehouse at 30 Church Street, New York City. Mr. Stanhope has a wide experience in petroleum, chemical, and pipe-line activities and possesses the engineering knowledge to handle all problems regarding tank equipment and safety devices for the control of volatile liquids and combustible gases. F. F. Tentschert, a sanitary engineer of wide experience, will assist Mr. Stanhope in the sewage and marine divisions of the Vapor Recovery Systems Co.

Frank M. Holloway, member of A.S.M.E. and formerly eastern sales manager, will assume new duties as southeastern sales manager with headquarters at New Orleans, La. John L. Shaunty has been appointed manager of Mid-Continent sales, distribution, and service. He will have complete charge of both Houston and Tulsa offices and warehouses.

A. J. Foley & Co., 7309 East End Avenue, Chicago, has been appointed "VAREC" representative in the Great Lakes area for "VAREC" sewage and marine equipment. Mr. Foley is a graduate mechanical engineer with experience qualifying him to collaborate on all problems of handling and controlling volatile liquids and combustible gases.

These appointments are in line with the large building and expansion program instituted by Frank V. Long in 1941.

## Hubler Inducted Into Army

Fred F. Hubler, associated with Petroleum Rectifying Co., Tretolite Co., and Dehydro Co. as advertising manager, was formally inducted into the Army on May 10.

Mr. Hubler has been assigned to the 940th Engineering Aviation Camouflage Battalion for preliminary training. Well known to the oil fraternity since his graduation from Stanford in 1931, Mr. Hubler's friends in the Mid-Continent and California join in wishing him the best of luck.

## Winners Named in Welding Program

The James F. Lincoln Arc Welding Foundation, Cleveland, Ohio, has announced the names of the winners of the awards of the engineering undergraduate program which extended from December 1, 1942, to April 1, 1943. In all, 77 awards, totaling $5,000, were made by the foundation to students representing 33 colleges and universities. The total of the seven scholarships won by their students for their universities was $1,750.

The paper entitled "Arc Welding Versus Casting in the Design of Jigs and Fixtures," won Herman J. Brenneke, of New York University, the first award of $1,000 and the additional honor of having four scholarships of $250 each presented in his name to his university's department of mechanical engineering.

## Zisette Becomes General Sales Manager of SKF

The appointment of Robert R. Zisette as general sales manager of SKF Industries, Inc., Philadelphia, Pa., mnufacturer of ball and roller bearings, has just been announced by Richard H. DeMott, vice president in charge of sales.

The degree of mechanical engineer was conferred upon Mr. Zisette by Yale University in 1921. In September of that year he started with SKF. After 1 year in engineering and sales departments, he became sales engineer in the Cleveland office. He remained in this position for 7 years, then was promoted to district manager of the Cincinnati office.

On June 1, 1942, he was promoted again, this time to the office of assistant sales manager.

## Johnson Will Represent Young Radiator Co.

Young Radiator Co., manufacturer of heat-transfer products for building, aircraft, automotive, marine, industrial, transportation and related fields, announces the appointment of A. R. Johnson, who will maintain offices in Long Beach and Los Angeles, Calif., as sales and engineering representative in the California territory south of and including Inyo, Kern and San Louis Obispo counties and Clark County in Nevada.

Mr. Johnson will provide a complete sales and engineering service on the line of heating, cooling and air-conditioning products including unit heaters and convectors made by Young Radiator Co. for factories, public buildings, apartment, homes and general space conditioning.

Prior to his affiliation with the Young company, Mr. Johnson was associated with Guy F. Atkinson Co.-George Pollock Co., contractors to the Navy, Long Beach, Calif.

# Classified Advertising

***The Market Place for the Oil Industry***

## UNDISPLAYED RATE

**8 CENTS A WORD, minimum charge $2 per insertion.**

**SITUATIONS WANTED, 4 cents a word, minimum charge $1.**

**BOX NUMBERS, count 9 words when replies are to be sent to our Tulsa Office.**

**10% DISCOUNT if 3 insertions are ordered at one time, with check accompanying order.**

**Classified display advertising set in single or double column style:**

## DISPLAYED—PER INCH

**Classified display advertising set in single or double column style:**

| | | |
|---|---|---|
| 1 inch | 1 time | $7.00 |
| 1 inch | 13 times | 6.50 |
| 1 inch | 26 times | 6.00 |
| 1 inch | 39 times | 5.50 |
| 1 inch | 52 times | 5.00 |

**Rates are governed by total space used within 12 months from date of first insertion. Credits are allowed when lower rates are earned.**

**FORMS CLOSE MONDAY NOON—PUBLISHED EACH THURSDAY**

## MONEY RAISING

WANTED: Working capital. Have geological data indicating probable location of several Gulf Coast salt domes or structures. Additional torsion balance stations necessary to correlate data to prove or disprove existence. If you have the money to invest and would be interested in discovering new oil reserves on a participating basis, address: Christian Iden, Geophysicist, Box 1589, Willis, Texas, or 1740 Commerce Bldg., Houston, Texas.

## FINANCING

CAPITAL SEEKERS—Interested in raising $25,000 or more for a legitimate project should write to AMSTER LEONARD, Fox Theater Bldg., Detroit, Mich.

## HELP WANTED

WANTED MECHANICAL ENGINEER

With experience in design of oil well drilling and servicing equipment. Excellent opportunity for a man with creative ideas, ability and good personality. The person employed to fill this position will work under the Chief Engineer and will be responsible for all work in this field. Permanent position with major company located in the Southwest. State education, experience, age, draft status and other particulars, including recent photograph in first letter. Essential worker applicant must have war manpower commission certificate of availability. Box B-640, The Oil and Gas Journal, Tulsa, Okla.

WANTED: Responsible Driller-explorer of new fields to drill for oil in western South Dakota on royalty basis. Box B-660, The Oil and Gas Journal, Tulsa, Okla.

Old established oil-country manufacturer offers a permanent position with future in West Texas. Field experience necessary. Acquaintance in area desirable. Salary and expense. Give complete information in letter of application. Address Box B-666, The Oil and Gas Journal, Tulsa, Okla.

**NOTICE TO ADVERTISERS**

Advertisers offering positions to workers skilled in critical war industries are requested by the War Manpower Commission to include the following sentence in their advertisement:

"Applications from those now employed in war industries will not be considered."

## SITUATIONS WANTED

SALESMAN: Wants connection with opportunity. Age 31, military exemption. Excellent character, good appearance. High school education. Experience as salesman, and oil and gas field superintendent. Good knowledge petroleum and gas industry United States and Canada. References. Write: Murray D. Rowe, 350 Bay Street, Toronto, Canada.

CABLE TOOL DRILLER: 23 years' experience, 42 years old, married, no children. Driller, toolpusher, contractor. Shut down own tools for duration to enter Army or Navy. Refused by both services for slight deafness in one ear. Pilot R.A.F. captain, in last war. Excellent physical condition. Can drill on any type machine or standard rig to any depth. Have had experience in Oklahoma, Texas, Kansas, Missouri, Wyoming, California, Indiana, Pennsylvania, New York, and the West Indies. Rotary driller in 1923-24. No rotary work since then. Will go anywhere but prefer wildcat job in Rocky Mountain district. Capable of drilling and/or running tools under any conditions. Member A.I.M.M.E. Can give many references. Now in California, can be reached through Box B-650, The Oil and Gas Journal, Tulsa, Okla.

GEOLOGIST, 38, B.S. University of Texas 1943. Available immediately for surface, subsurface, core analysis, drafting, leasing, petrographic work, study of well samples, or insoluble residues. Will go anywhere. Please write to Box B-664, The Oil and Gas Journal, Tulsa, Okla.

LUBRICATING SALES EXECUTIVE or representative with a background of twenty-five years experience is seeking a change within the near future. Possess extensive knowledge of refining, application and sales of both paraffin and naphthenic oils. Not opposed to any location, however, acquaintance with tank car purchasers is largely confined to a wide midwestern area. Further details will be readily extended to interested parties. Address Box B-661, The Oil and Gas Journal, Tulsa, Okla.

ACCOUNTANT, experienced in public and private practice, age 40, married, 4H, now part owner and active in management of old established gasoline plant, desires additional accounting work for oil properties in Texas. Office in Fort Worth. Thoroughly conversant with Federal and State oil reports, tax requirements, and oil accounts. Would assume responsibility for complete operation and management of oil properties. Best references and good credit rating. Address Box B-663, The Oil and Gas Journal, Tulsa, Okla.

## SITUATIONS WANTED

OIL STATISTICIAN
TAX ACCOUNTANT
EXECUTIVE

Now employed as Secretary-Treasurer, oil producing company. Desire change of my own volition. Familiar with Federal and States Taxes, including Income, Declared Value Excess Profit Taxes, all Governmental and State reports pertaining to oil industry. Reorganizations under Federal Chandler Act, systems and accounting procedure, Production, Pipe Lines and Refinery branches, as well as Joint Interest ventures. Public Accounting experience. Desire permanent connection with substantial concern. Age 44, draft exempt. Post Office Box No. 2991, Dallas, Texas.

REFINERY TECHNICIAN—Chemical Engineer; Experienced superintendent, Chief Chemist, consultant; Process development and supervision; all phases refinery operation including waxes, asphalts, specialties; progressive, ambitious. Executive type position desired where past eighteen years experience can be used in management, direction, supervision, consulting, and advising capacities. Box B-656, The Oil and Gas Journal, Tulsa, Okla.

PETROLEUM and CHEMICAL ENGINEER, seventeen years experience, desires work as process engineer or chief chemist. Age 42 years. Dependents. Normal health. Box B-662, The Oil and Gas Journal, Tulsa, Okla.

CONSTRUCTION ENGINEER, 35 years old, 3B. 15 years' experience, 6 years in own consulting construction business—high pressure and topping construction. Prefer Texas or Southern part of country. Desire permanent connection with reliable consulting or oil firm. Box B-665, The Oil and Gas Journal, Tulsa, Okla.

CHEMIST, B.A. 1933, with 5 years analytical and research experience and 2 years experience in gasoline plant operation, desires responsible position in either laboratory or plant operation. Age 32, married, draft 3-B. Available on reasonable notice. Box B-667, The Oil and Gas Journal, Tulsa, Okla.

## LEGAL BLANK

OIL FIELD LEGAL BLANKS

Leases, assignments, releases, township plat books, well records, etc. Request on your letterhead gets free catalog. Olds Press, 215 East Third St., Tulsa, Okla.

## INCORPORATION

DELAWARE CHARTERS: Powers broad, taxes low. Many of the largest corporations have Delaware charters. Complete service $35. Submitted forms. Chas. G. Guyer, Inc., Wilmington, Delaware.

## LEASES AND DRILLING BLOCKS

NEW MEXICO
State Oil and Gas Leases

Forty acres and multiples thereof, in a new HoT spot, 23 oil companies own surrounding leases. Write for information. No obligation. HARRY S. WRIGHT, New Mexico State Lessee, Farmington, N. M.

FOR SALE—Oil and Gas Leases on structure, oil production, acreage for drilling contracts, also proven tracts of fluorspar. W. P. Harley, Bowling Green, Ky.

FOR SALE: Real Bargains! New 20 or 40 acre lease, hot play, near production, Shelby County; also 4,000 acre drilling block on structure. Write C. A. Parker, Box 451, Center, Texas.

**LEASES ROYALTIES**

**PRODUCING OR NONPRODUCING**

**Texas, New Mexico, Oklahoma, Louisiana and Illinois.**

**20 Years' Experience**

**Inquiries Invited.**

**B. D. BUCKLEY**
**40 Broadview Drive, Clayton**
**St. Louis, Mo.**

*(Continued on Next Page)*

# CLASSIFIED ADVERTISING — EQUIPMENT FOR SALE

## Liquidating 4 Complete Refineries

**Our latest acquisition to be offered for immediate liquidation.**

**Olney Refining Co.**
**Olney, Texas**

**Lynch Refining Company**
**Kilgore, Texas**

**Evansville Refining Co.**
**Evansville, Indiana**

**Titan Refining Company**
**Stark, Michigan**

**Complete stocks refining equipment, valves and fittings. Immediate delivery from our Tulsa Warehouse.**

## Refinery Equipment, Inc.

W. C. Berry
Union Ave. at 21st Street

Robert W. Duden
Tulsa, Oklahoma

---

FOR SALE: 300-13" OD, 8 thread, new casing couplings. 1—Gasoline Power Drilling Rig good for 3000'. Also Steam Drilling Rigs and pipe and casing of all sizes. We also purchase abandoned Leases, Refineries, pipe lines and other oil field equipment. If in need of material, or have material for sale, communicate with LOUISIANA IRON & SUPPLY CO., Shreveport, La., Phone 5223, or L.D. 1.

---

FOR SALE: One Cardwell R. L. Drawworks with spudder attachment, two 6" drill collars, 4½" kelly, core barrel, traveling block, hook, swivel, steel doghouse, light plant, and all necessary tools for rotary rig including 92' steel mast, also one 76 all steel Star Spudder mounted on mud boat. Equipment at Salem. HARVEY H. SIMS DRILLING CO., Box 180, Salem, Illinois.

---

FOR SALE: Steel Building near Crane, Texas. Standard Butler building with steel framework, size 38' x 140' x 10'. Eleven revolving-type ventilators, twenty-six windows, six doors. Cities Service Oil Company (Pennsylvania), Houston, Texas.

---

FOR SALE — 72 Beaird Steel Headers, 4" I.D., 2000 lbs. test press.; 30 Brewster Steel Headers, 4" I.D., 3000 lbs. test press.; 30 B.W.Y. C.R. Steel Headers, 4" I.D., High Pressure. ARROW PETROLEUM CO., Centralia, Ill.

---

1—60 HP HRT Boiler
1—200 HP Water Tube Boiler
All Sizes Oil Country Boilers
25,000 Feet New 4" OD 14 Gauge Buttweld Steel Tubing

**LUCEY PRODUCTS CORPORATION**
Tulsa, Oklahoma

---

FOR SALE: 1 Buckeye #34 used ditching machine. H. L. GENTRY ENGINEERING COMPANY, Jackson, Michigan.

---

Second hand Oklahoma City alloyed sucker rods, ¾", ⅞" and 1".
Have sold millions of feet with satisfactory results. I recommend these rods up to 4000 ft.

M. R. TRAVIS
1702 S. Boulder — Tulsa, Oklahoma

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## HORIZONTAL TANKS

3—14,250 Gal. Cap. 9' x 30'
2—11,250 Gal. Cap. 8' x 30'
1—10,500 Gal. Cap. 10' x 17'
2—18,000 Gal. Cap. 10' x 30'

Located Illinois and Michigan

**R. C. STANHOPE, Inc.**
60 E. 42nd St. — New York, N. Y.

---

FOR SALE: Complete slim hole rotary rig. Cardwell Drawworks, 7¼ x 12 Gardner Pump powered by 225 HP Waukesha Engine, 4200' of 3½" drill pipe, etc. Melton Machinery & Supply Co., Seminole, Okla.

---

FOR SALE at Chase, Kansas warehouse 8,000 feet 3" 9.30# 10V Thread Upset used Seamless Steel Tubing. Cities Service Oil Company, Patridge, Bartlesville, Okla.

---

FOR SALE: Slightly used—2-F-M 2-Cyl. Model 47—B.O. Diesel or gas engines, 1—7¼" x 14" G-D. Power Slush Pump. 3800 ft. 6⅝" Pittsburgh Special D.P. Hughes Joints. 1—Large 8" Emsco rotary rig with F-M Diesel power. Box B-646, The Oil and Gas Journal, Tulsa, Okla.

---

FOR SALE: Two Model HL Cardwell Double Drum Spudders. One 29W Bucyrus-Erie Type "E" all Steel Spudder. One Model "ET" Franks well servicing unit, equipped with 3-sheave mast, mounted on C-55 International truck. Motor recently overhauled. One OCS Pup Truck Type well servicing unit, equipped with 2-sheave mast, mounted on C-50 International Truck. Motor completely overhauled. One 1938 9.20 White Tandem Truck, long wheel base, equipped with heavy Braden Winch, flat oil field bed, rolling tail board, gin poles, Motor recently factory reconditioned. One 1941 Ford 1½ Ton Truck, equipped with Tulsa Winch, oil field bed, gin poles. One 1940 D-35 International Truck equipped with Tulsa Winch. B. M. McGraw, Carmi, Ill.

---

4000' GRADE D 3½" OD 13.30# range 2 internal flush external upset drill pipe equipped with Hydril tool joints; also, 5000' full hole 4½" OD 16.60# range 2 drill pipe. Chas. B. King, Panhandle Bldg., Wichita Falls, Texas.

---

FOR SALE: 1—2000 Barrel Parkersburg Bolted Steel Tank, 12 gauge throughout. Complete with inside and outside ladders. In new condition. L. L. DITTOE, Somerset, Ohio.

---

TWO Vogt Horizontal water tube boilers, 125# steam pressure allowed. Equipped with Laclede chain grate stokers. 356 West North Street, Indianapolis, Indiana.

---

162—3½" OD—6½" Centers—Chrome Key Headers
30—Pieces 3½" ID—4" OD—21' to 28' Long—Chrome Tubes
120—Pieces 3" ID—3½" OD—30' Long—Chrome Tubes
1—½" Shell 5' x 74'—4000 barrel cap. Crude Oil Fractionator with Trays
30—Pumps, various sizes and types

ARROW PETROLEUM CO.
FOREST PARK, ILL.

---

OIL FIELD EQUIPMENT FOR SALE
by L. V. HULL
205 Panhandle Building
Wichita Falls, Texas

1—35 HP Reed Gas Engine; 1—18 ft. Band Wheel Reed Power; 1—13¼ x 6 x 10 Ingersoll-Rand Compressor; Galvanized Building for the above equipment. 1—250 Barrel Circulating Water Tank.

---

1—30 x 60 x 14 trussed, bolted steel building, 85% corrugated iron, good 15' louver in top of building; steel sash, steel doors. BARTLETT ELECTRIC CO., 115 N. Boston, Tulsa, Okla.

---

**50,000 Bbl. Tank**

All steel, cut down, rivets backed out and match marked. Ready for loading. Located Sunburst, Montana. Guaranteed A-1 condition in every respect.

**Also 4—55,000 Bbl.**

5 ring all steel tanks located in Okla. A-1 condition.

**1—37,500 Bbl.**

all-steel storage tank. Located El Dorado, Kansas. Offer as is, where is, or dismantled, match marked and loaded.

**REFINERY EQUIPMENT, INC.**
Union Ave. at 21st St. — Tulsa, Okla.

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**PUMPING EQUIPMENT**

Gas Engines — Generators—Motors—O.C.S. Units—Separators—Cooling Tank—Rods and other equipment. Ad. W. M. Gallagher, 315½ North Broadway, Oklahoma City, Okla.

---

FOR SALE: 1—37½ HP FM Semi Diesel Single Cylinder Vertical Oil Engine, Type Y, Style V, Direct Connected to 25 KW 250 V DC Generator with Panel Board, as is, $1,250.00. Cities Service Oil Co., Patridge, Bartlesville, Okla.

---

**MACHINE BOLTS GALVANIZED**

25,000 good used, ⅝" x 1½"; ⅝" x 2"; ¾" x 1½"; ¾" x 2"; ¾" x 2½"; priced 5c complete Bolt and Nut. A. A. GILBERT PIPE & SUPPLY CO., Shreveport, La.

---

FOR SALE: One Model 45 Heavy Duty Star Spudder, mounted on rubber, 110 HP Waukesha power unit. One K-Type Star Spudder, Allis-Chalmers power unit. Sell with or without tools and lines. Box 378, Cherryvale, Kansas.

---

## FOR SALE

65,000' of 5" Standard line pipe—5⅛" outside diameter, weight 15# per foot.
Genuine wrought iron pipe, T&C, in excellent condition.
Pipe is now located at railroad siding near Bethlehem, Pennsylvania, ready for immediate shipment. Regular ceiling price for this wrought iron pipe same as for steel pipe.
For particular details, contact THE

PRODUCERS SUPPLY & TOOL COMPANY, Fort Worth, Texas, or THE INTERSTATE PIPE & SUPPLY COMPANY, Marietta, Ohio.

---

## FOR SALE

100,000 First Class fire brick;

Steel Stack 4½' x 150';

Hot Gas recirculating fan;

3" and 4" 1500 pound flanged fittings.

All located Garber, Okla.

Wire or write

**HUSKY REFINING COMPANY**
Cody, Wyoming

# Classified Advertising

## EQUIPMENT FOR SALE

SEISMOGRAPH EQUIPMENT. COMPLETE 8 trace seismograph equipment, 8 dynamic geophones complete with filters flat from 30 to 200 cycles, automatic distortionless expander, coil galvanometers, automatic oscillograph, all latest type. First class recording truck, vacuum water and shooting trucks, complete drilling equipment. Rubber excellent. Complete. Ready to start to the field. Box 541, SMU, Dallas, Texas.

FOR SALE: Practically new Webber 90 HP as oil or 50 HP as gas engine, heavy grooved fly wheel for (C) V-belts for driving generator. Bernice C. Yount, Ottawa, Kansas.

## EQUIPMENT WANTED

WANTED: Low power binocular microscope, preferably Spencer make, suitable for examination of oil well cuttings. Give full details first letter including make, model, condition, range of power, and price. Cosden Petroleum Corp. Att'n.: Mr. C. F. Barnes, Geologist, P. O. Box 1311, Big Spring, Texas.

EQUIPMENT WANTED: Magnetometer for oil prospecting. State price and condition. Box B-581, The Oil and Gas Journal, Tulsa, Okla.

WANTED: Good used centrifugal pumps 1", 1¼", 1½" and 2". Advise price and condition. CENTRAL PIPE & SUPPLY CO., P.O. Box 1442, Lubbock, Texas.

AIR or gas compressor, horizontal type, 7x7 or 8x8 double acting, belt driven. Chas. B. King, Panhandle Bldg., Wichita Falls, Texas.

**WANTED**

Used storage tanks:
Pressure Tanks:
All sizes
Send us your list.

**SONKEN-GALAMBA CORP.**
108 N. 2nd St., Kansas City, Kansas

## EQUIPMENT WANTED

**WANTED**

Used Structural Steel
Pipe — Valves
Fittings
Send us your list

**SONKEN-GALAMBA CORP.**
108 N. 2nd St., Kansas City, Kansas

## WANTED

COMPLETE Plants, Pipe-Lines, and Industrial Enterprises bought for cash or liquidated for the owners. Wire, phone, or write—INDUSTRIAL SUPPLY & EQUIPMENT CO., INC., 1044 Canal Bldg., New Orleans, La.—MA 5586.

## PATENT ATTORNEYS

PATENTS, Trade-Marks, Booklet, "General Information Concerning Inventions and Patents" and "Free Schedule" sent without obligation. Established 1915. Lancaster, Allwine & Rommel, Suite 418, Bowen Bldg., Washington, D. C.

## FOR SALE—MAPS

SO. GEORGIA MAPS
Where Majors are leasing.
Write
C. W. DEMING, WAYCROSS, GA.

## BUSINESS OPPORTUNITIES

HIGH GRADE FULLERS EARTH DEPOSIT. Very extensive and shallow overburden. On Railway and highway, centrally located to main refining districts. Clay suitable for mineral oils and as catalyst. Sale or royalty. Experienced operation engineer available. Advertiser, 210 Cotton Exchange Bldg., Memphis, Tenn.

NEAR Montreal, P.Q.—A 125 lb. valve couldn't hold gas pressure, 6" and 8" pipes down to the rock. Must be oil there. Romeo Defresne, 308 Broadway, Lachine, P.Q., Canada.

## Permian Basin, Panhandle

(Continued from Page 98)

Johney Cockburn 14 B Pearl Miller, NE SW 25-17s-32e, flow 250 bbl., shot 220 qt., 4,110-4,210 ft., T.D. 4,210 ft.

Maljamar Oil & Gas 16-A Mitchell, NW NW 20-17s-32e, flow 200 bbl., pay 3,986 ft., shot 90 qt., T.D. 4,023 ft.

Rhodes, Lea County: Anderson-Prichard 2 Lottie Gregory, 2,180 ft. from S, 660 ft. from W, 27-26s-37e, I.P. 51 bbl., lime pay 3,287 ft., shot 100 qt., T.D. 3,327 ft.

South Lovington, Lea County: Stanolind Oil & Gas 9-E State, SW NE 2-17s-36e, elev. 3,847 ft., I.P. 48 bbl., pay 4,695 ft., acid 7,500 gal., T.D. 5,147 ft.

Square Lake, Eddy County: W. S. Randall 5-A Etz, NE SW 26-16s-30e, flow 80 bbl., pay 3,045 ft., shot 140 qt., P.B. 3,165 ft. from T.D. 3,214 ft.

## Italian Financiers Expand Holdings in Rumania

The Italian financial group, Montecatini, has acquired all the shares of the Petrolina Co., Ploesti, Rumania, which has increased its capital from 20,000,000 to 160,000,000 lei (191.30 lei =$1) and probably will further increase its capital to a total of 300,000,000 lei. The Petrolina Co. owns 750 acres of oil land and a few months ago purchased a property with seven wells, in Pitigaria, from the Foraj Lemoine A.G., Ploesti.

In addition, Montecatini has acquired the Continentale Petrolifera A.G., Bucharest (capital 6,000,000 lei), which is exploiting oil fields in Moreni and Chiuciura, and the Xenia A.G., Bucharest (capital, 50,000,000 lei), which owns a refinery in Ploesti.

## New Corporation Given Chile Exploration Task

Control of petroleum exploration work, drillings, and kindred activities in the Magallanes zone of Chile has been transferred from the Bureau of Mines and Petroleum of the Ministry of Economy and Commerce to the Fomento Corporation (Corporacion de Fomento de la Produccion). The corporation has allotted 15,000,000 pesos for this work.

According to a recent statement of the Ministry of Economy and Commerce, there are indications that petroleum exists in the Province of Arauco, but it cannot yet be stated whether commercial quantities are available.

## Republic Authorized To Remove Line

Republic Pipe Line Co. has been authorized by the Texas Railroad Commission to remove approximately 8½ miles of 4-in. gathering line in the Saxet and Saxet Frio fields of Nueces County, according to copies of the order issued last week.

## Crude-Oil Prices

Representative selected crude prices from all sections of the country appear below:

| | |
|---|---|
| East Texas | $1.25 |
| Conroe | 1.43 |
| Tepetate, Louisiana | 1.18 |
| Illinois basin | 1.27 |
| Pecos County, Texas | .98 |
| Bradford, Pennsylvania | 3.00 |
| Van, Van Zandt County, Texas* | 1.08 |

*No change since 5-21-41.

### Gravity Schedules

Top prices include all gravities above grades designated, and low prices include all gravities below grades designated:

| Gravity— | Signal Hill, Calif. | Oklahoma, Kansas | Gulf Coast Texas | West Texas* |
|---|---|---|---|---|
| 18-18.9 | $0.80 | .... | .... | .... |
| 19-19.9 | .84 | .... | $1.06 | $0.70 |
| 20-20.9 | .88 | $0.85 | 1.08 | .72 |
| 21-21.9 | .92 | .87 | 1.10 | .74 |
| 22-22.9 | .96 | .89 | 1.12 | .76 |
| 23-23.9 | 1.00 | .91 | 1.14 | .78 |
| 24-24.9 | 1.03 | .93 | 1.16 | .80 |
| 25-25.9 | 1.07 | .95 | 1.18 | .82 |
| 26-26.9 | 1.11 | .97 | 1.20 | .84 |
| 27-27.9 | 1.15 | .99 | 1.22 | .86 |
| 28-28.9 | 1.18 | 1.01 | 1.24 | .88 |
| 29-29.9 | 1.20 | 1.03 | 1.26 | .90 |
| 30-30.9 | 1.23 | 1.05 | 1.28 | .92 |
| 31-31.9 | .... | 1.07 | 1.30 | .94 |
| 32-32.9 | .... | 1.09 | 1.32 | .96 |
| 33-33.9 | .... | 1.11 | 1.34 | .98 |
| 34-34.9 | .... | 1.13 | 1.36 | 1.00 |
| 35-35.9 | .... | 1.15 | 1.38 | 1.02 |
| 36-36.9 | .... | 1.17 | 1.40 | 1.04 |
| 37-37.9 | .... | 1.19 | 1.42 | 1.06 |
| 38-38.9 | .... | 1.21 | 1.44 | 1.08 |
| 39-39.9 | .... | 1.23 | 1.46 | 1.10 |
| 40 and above | .... | 1.25 | 1.48 | 1.12 |

*Includes Lea County, New Mexico.

## LEGAL

U. S. DEPARTMENT OF THE INTERIOR, District Land Office, Las Cruces, New Mexico. Notice is hereby given that the S½ NW¼ sec. 9, T. 22 S., R. 37 E., N.M.P.M., New Mexico, 80 acres of land in the Penrose-Hardy oil and gas field, is offered as one parcel to the responsible qualified bidder of the highest bonus per acre for lease under section 17 of the act of February 25, 1920 (41 Stat. 437), as amended, at the royalty rate scale in the lease form in General Land Office Circular 1386, at a sale to be held in the district land office at Las Cruces, New Mexico, at 10 o'clock a.m. on July 28, 1943. The successful bidder must deposit on the date of the sale a certified check on a solvent bank, or cash, for one-fifth of the amount of his bid, and file a showing of qualifications to receive the lease as required by section 7 of Circular 1386. The remaining four-fifths, together with the annual rental in advance at the rate of $1 per acre, must be paid and a $5,000 corporate surety bond must be furnished prior to the issuance of the lease. The bidders are warned against violation of the provisions of section 59 of the United States Criminal Code, approved March 4, 1909, prohibiting unlawful combination or intimidation of bidders. The right is reserved to reject any and all bids at the discretion of the Secretary of the Interior. Register.

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# Journalisms:

POUR - DEPRESSANT - TREATED motor oils under storage conditions sometimes become solid at temperatures higher than their A.S.T.M. pour points. Caleb E. Hodges, Standard Oil Co. of New Jersey, and A. Bruce Boehm, Stanco Distributors, Inc., conducted a series of experiments showing the effect of temperature cycling and composition of oil on this phenomenon using various types of lube oils blended with Paraflow. The results obtained by them will be presented in an article to appear in next week's Engineering and Operating Section.

WHEN we took our college work the motto "Us Engineers Ain't Got No Use for English" was supposed to be tattooed on the chest of every engineering graduate. Actually, engineers have considerable use for English since the writing of reports constitutes one of their most important duties. How to organize and write a report is the subject of an article scheduled to appear in an early issue by an engineer on The Journal's staff who has had much experience along this line.

PENNSYLVANIA crude is generally considered to yield relatively poor grades of gasoline. Modern catalytic cracking can take this low-octane motor fuel and, by reforming, convert it into aviation gasoline with high-octane values. How it is done is the subject of an article by V. I. Komarewski and C. H. Riesz, of the department of chemical engineering, Illinois Institute of Technology, which will appear next week.

ALONG the same general lines, F. M. Simpson, Cities Service Oil Co. will describe that company's alkylation and isomerization plant which is producing important quantities of 100-octane aviation gasoline.

DISPOSAL of brines is becoming a problem of increasing importance in many areas. A staff article, which will appear in next week's issue will describe how a group of Kansas operators organized a unitized water-disposal project which has proved most effective.

THE sweetening and desulfurizing of sour crudes is the subject of a staff article in next week's Journal, rounding out an Engineering and Operating Section of outstanding interest.

# CALENDAR

**June.**

PENNSYLVANIA GRADE CRUDE OIL ASSOCIATION, twentieth annual meeting, Pittsburgh, Pa., June 25.

INTERSTATE OIL COMPACT COMMISSION, summer quarterly meeting, William Penn Hotel, Pittsburgh, Pa., June 25-26.

AMERICAN SOCIETY FOR TESTING MATERIALS, annual meeting, Hotel William Penn, Pittsburgh, Pa., June 28 to July 2.

**July**

PETROLEUM INDUSTRY WAR COUNCIL, regular meeting, Washington, D. C., July 14.

**September**

AMERICAN CHEMICAL SOCIETY, petroleum division, fall meeting, Septemper 6-10. Place of meeting not yet determined.